

**FIRST QUARTER MONITORING REPORT**  
**JANUARY TO MARCH 2001**  
**KIN-BUC LANDFILL OPERABLE UNITS 1 AND 2**

Prepared for  
SCA Services, Inc.  
Edison Township, Middlesex County, New Jersey  
May 2001

Prepared by  
EMCON/OWT  
Crossroads Corporate Center  
One International Boulevard, Suite 700  
Mahwah, New Jersey 07495

OWT Project 791186

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## **EXECUTIVE SUMMARY**

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The Kin-Buc Landfill Site is a closed 200-acre industrial/commercial landfill located in Edison, New Jersey, which the USEPA placed on the National Priorities List (NPL) in 1981. A Remedial Investigation/Feasibility Study (RI/FS) was conducted between 1983 and 1988 which resulted in a Record of Decision (ROD) by USEPA in 1990 that called for source control of Operable Unit 1 (OU1).

The remedial action specified in the ROD for OU1 included the construction of a slurry wall around OU1, the collection and treatment of leachate and groundwater from within the containment area, and the capping of the area within the slurry wall. Remedial construction activities for OU1 were completed by the end of August 1995.

In accordance with the RODs, hydraulic monitoring and landfill gas monitoring is conducted on a quarterly basis to evaluate the effectiveness of the remedial actions. This report documents the results of the monitoring activities for the First Quarter of 2001.

### **Remedial Objectives**

The general remedial objectives of the OU1 closure and collection systems are to contain source leachate and contaminated groundwater, and to prevent further migration of site-related contaminants. The primary objective of leachate collection system is to impose an inward gradient as measured across the slurry wall in the refuse unit. The primary objectives of the groundwater collection system is to prevent migration of contaminated groundwater towards the slurry wall and impose an upward gradient from the bedrock unit to the sand & gravel unit.

### **Hydraulic Control and Monitoring System**

The hydraulic control system for OU1 consists of leachate and groundwater collection systems. The leachate collection system consists of a perforated pipe that runs parallel to the inside of the perimeter slurry wall and 4 pump stations. The groundwater collection system consists of 4 pumping wells.

The hydraulic monitoring system for OU1 is located along the circumferential slurry wall with many of the wells located in 5 clusters, called transects. The hydraulic monitoring wells at the transects are installed in pairs, within the same hydrogeologic unit, with

1 well inside and 1 well outside the circumferential slurry wall. Twenty-four of the monitoring wells are continuously monitored using water level recorders.

Hydraulic monitoring network consists of wells screened in the refuse, sand & gravel, and bedrock units. Well designations of G, S, or R denote hydraulic units of refuse, sand & gravel or bedrock, respectively.

The OU2 hydraulic monitoring well network is located in the Low-Lying Area and Mound B, and monitors groundwater elevations outside of the OU1 containment area.

### **First Quarter Hydraulic Monitoring Activities**

Manual groundwater elevation measurements were obtained and continuous water level data downloaded from the monitoring wells in OU1 and OU2 during site visits on January 29, February 7, February 28, and March 21, 2001.

Hydraulic monitoring indicates that intragradient conditions in the refuse unit (lower water levels in the refuse inside the wall relative to water levels outside the wall) were maintained at all of the TL throughout the quarter. Intragradient conditions in the sand & gravel unit (lower water levels in the sand & gravel unit inside the slurry wall relative to water levels outside the wall) were maintained at TL's Nos. 3 and 4 throughout the quarter. The average flow condition at TL No. 2 was intergradient throughout the quarter, although there were intermittent periods where intergradient conditions were not maintained. On average, upward gradient conditions between the bedrock and the overlying sand & gravel deposits were generally maintained at the TLs inside of the slurry wall throughout the quarter.

The synoptic groundwater elevations obtained during the First Quarter of 2001 indicate both upward and downward hydraulic gradients between the different geologic strata.

### **Leachate Withdrawal/Groundwater Pumping**

Groundwater was collected from S&G Wells 1, 2, and 3 at an average rate for the quarter of 12,462 gpd. The total volume of groundwater collected for the quarter was 1,134,082 gallons. Leachate was collected at an average daily rate of 854 gpd for the quarter, and the total volume of leachate collected was 77,687 gallons. Both groundwater and leachate collection were generally consistent with recommended withdrawal rates.

### **Landfill Gas Monitoring**

Combustible gas was not detected in any of the 6 gas monitoring wells located on the north side of OU1. Based on the non-detection of combustible gas in the monitoring wells, the active gas collection system is functioning properly and there is no off-site gas

migration. Monitoring at the flare inlet port revealed that the landfill gas collection system was delivering 35.3 percent combustible gas to the flare.

## 1 INTRODUCTION

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The Kin-Buc Landfill Site is a closed 200-acre industrial/commercial landfill located in Edison, New Jersey, which operated under a New Jersey Department of Environmental Protection (NJDEP) permit until 1976. The USEPA placed the Kin-Buc Landfill on the National Priorities List (NPL) in 1981. Between 1983 and 1988, the Respondents conducted a Remedial Investigation/Feasibility Study (RI/FS) which resulted in a Record of Decision (ROD) by USEPA in 1990 which called for source control of Operable Unit 1 (OU1), and an additional RI/FS to determine the nature and extent of contamination outside the source area, thus defining Operable Unit 2 (OU2).

Operable Unit 1 includes both Kin-Buc I and II Mounds, the former Pool C Area and a portion of the Low-Lying Area between Kin-Buc I and the Edison Landfill. The remedial action specified in the ROD for OU1 included the construction of a slurry wall around OU1, the collection and treatment of leachate and groundwater from within the containment area, and the capping of the area within the slurry wall.

Operable Unit 2 includes Mound B, Edmonds Creek and adjacent wetlands, the remaining Low-Lying Area between OU1 and the Edison Landfill, Martins Creek, and the Raritan River. The OU2 ROD called for the excavation and disposal of PCB-contaminated sediments from within the Edmonds Creek Marsh Area, the restoration of disturbed wetland areas, and groundwater/surface water monitoring.

Remedial construction activities for both OU1 and OU2 were completed by the end of August 1995.

In accordance with the RODs, hydraulic monitoring and landfill gas monitoring is conducted quarterly to evaluate the effectiveness of the remedial actions. This report documents the results of the monitoring activities for the First Quarter of 2001.

## **2 DESCRIPTION OF MONITORING PROGRAM**

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### **2.1 Hydrogeologic background**

The primary hydrogeologic units within OU1, from ground surface downward, are refuse, meadow mat, sand & gravel, and bedrock. Near the northern portion of the site the bedrock is closer to the surface and there is no sand & gravel unit in that area.

The southern portion of the site is located in close proximity to the Rartin River. As a result, monitoring wells located on the southern side of OU1 are impacted by tide fluctuations.

### **2.2 Remedial Objectives**

The general remedial objectives of the OU1 closure and collection systems are to contain source leachate and contaminated groundwater, and to prevent further migration of site-related contaminants. The specific remedial objectives for the leachate collection, groundwater collection, and hydraulic monitoring are summarized as follows:

#### **Aqueous Leachate Collection**

- Primary
  - Collect leachate from the refuse unit within the perimeter slurry wall to impose an inward gradient as measured across the slurry wall (hydraulic containment).
- Additional Benefit
  - Reduce the downward gradient between the refuse unit and the underlying sand & gravel or bedrock units.

### **Sand & Gravel Groundwater Collection (in Primary OU1 Containment)**

- Primary
  - Prevent migration of contaminated groundwater towards the slurry wall.
  - Impose an upward gradient from the bedrock unit to the sand & gravel unit (hydraulic containment).
- Additional Benefit
  - Impose an inward gradient within the sand & gravel unit as measured across the perimeter slurry wall (hydraulic containment).

### **Sand & Gravel Aquifer Groundwater Collection (in Oil Seeps Area Containment)**

- Collect sand & gravel groundwater from within the Oil Seeps Area if an upward gradient between the sand & gravel and the refuse units cannot be imposed by leachate collection alone.

## **2.3 Hydraulic Control and Monitoring System**

The hydraulic control system for OU1 consists of 5 leachate pump stations, and 4 sand & gravel groundwater pumping wells. The leachate collection system consists of a perforated pipe that runs parallel to the inside of the perimeter slurry wall. In addition, a corrugated oily leachate collection conduit is located along the south side of Kin-Buc I mound. The layout of the collection system is shown on Drawing 1.

The hydraulic monitoring system for Operable Unit 1 is located along the circumferential slurry wall with many of the wells located in 5 clusters, called transects. The OU1 hydraulic monitoring well network consists of 11 wells screened in the refuse/fill, 8 wells screened in the sand & gravel, and 10 wells screened within bedrock. A summary of the well network is provided in Table 2-1, and the well locations are shown in Drawing 1.

The hydraulic monitoring wells at the transects are installed in pairs, within the same hydrogeologic unit, with 1 well inside and 1 well outside the circumferential slurry wall. The design of the well network allows groundwater elevations to be monitored on either side of the slurry wall and provides data to evaluate the performance of the slurry wall as a hydraulic barrier.

At transect locations (TLs) 2, 3 and 4, the hydraulic monitoring wells are installed in the refuse, sand & gravel and bedrock units. At Transect Locations 1 and 5, the hydraulic monitoring wells are installed only in the refuse and bedrock units due to the absence of sand and gravel deposits in these areas. Wells designations of G, S, and R denote

hydraulic units of refuse, sand & gravel and bedrock, respectively. A list of the monitoring wells at the 5 transects locations is provided in Table 2-3.

The OU2 hydraulic monitoring well network is located in the Low-Lying Area and Mound B, and monitors groundwater elevations outside of the OU1 containment area. The hydraulic monitoring system for OU2 consists of 16 wells, as indicated in Table 2-2 and as shown on Figure 2-1. Water elevation measurements from the OU2 wells are taken manually concurrent with the OU1 monitoring activities.

## **2.4 First Quarter Hydraulic Monitoring Activities**

Monitoring and sampling for the First Quarter of 2001 (January to March) took place according to the procedures and methods outlined in the Draft Operations and Maintenance (O&M) Manual for the Kin-Buc Landfill, prepared on behalf of the Respondents by Wheelabrator EOS in September 1995 and modified by letter to EPA dated February 28, 1996. The modified hydraulic monitoring program will be approved by the USEPA upon final approval of the Draft O&M Manual.

Components of the hydraulic monitoring program consist of continuous and manual water level measurements. Manual measurements were obtained with an electronic water level indicator. Continuous water levels were obtained at 1-hour intervals using 24 In-Situ "Trolls", Model SP4000 data logger and transducer.

Manual groundwater elevation measurements were obtained from the monitoring wells in OU1 and OU2 during site visits on January 29, February 26, and March 21, 2001. The manually recorded water level monitoring results are provided on Table 2-3.

Three months of continuous water level data have been obtained from the refuse and sand & gravel wells at the site from January 1, 2001 to March 31, 2001. The minimum and maximum recorded water elevations for each month in the quarter are provided in Table 2-4. Continuous groundwater elevation graphs organized by transect location and hydrogeologic unit are provided in Appendix A. Evaluations of the recorded data is performed on a monthly basis. Copies of these monthly evaluations are provided in Appendix B.

## **2.5 Continuous Hydraulic Monitoring Results vs. Manual Elevation Measurements**

The continuous water level monitoring information collected by the Trolls was compared with the data collected from the 3 manual recordings to provide information on the relative accuracy of manual versus automatic recordings. Table 2-5 shows the difference between the 3 manual water level elevation measurements and Troll recordings for the

same day and hour. Differences between the manual and continuous measurements were below 0.3 feet for all wells except W-15G which was at -0.41. Based on the comparison above the Troll device data is satisfactory and reflects accurate groundwater elevations.

### **3 HYDRAULIC MONITORING**

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A summary of the First Quarter hydraulic profile is provided in figure 3-1. Intragradiant conditions in the refuse unit (lower water levels in the refuse inside the wall relative to water levels outside the wall) were maintained at all of the TL throughout the quarter. Intragradiant conditions in the sand & gravel unit (lower water levels in the sand & gravel unit inside the slurry wall relative to water levels outside the wall) were maintained at TL Nos. 3 and 4 throughout the quarter. The average flow condition at TL No. 2 was intergradient throughout the quarter although there were intermittent periods where intergradient conditions were not maintained. On average, upward gradient conditions between the bedrock and the overlying sand & gravel deposits were generally maintained at the TLs inside of the slurry wall throughout the quarter. The detailed analysis of the hydraulic conditions at each transect in the various hydrogeologic units is provided below.

#### **3.1 Assessment of Hydraulic Conditions in the Refuse Unit**

Hydrographs 1 through 5 located in Appendix A show the continuous water levels in the refuse wells at TL Nos. 1 through 5. The heavier weight line denotes wells located outside the slurry wall. A straight line on the hydrograph signifies that the water levels were below the range on the Troll. The hydrographs show that intragradiant conditions (lower water levels in the refuse inside the wall relative to water levels outside the wall) were maintained at all of the TL throughout the quarter. A detailed analysis of each of the TL is provided below.

##### **TL No. 1 (W-1G/W-2G)**

Troll measurements indicate that intragradiant conditions were maintained in the refuse unit throughout the quarter at TL No. 1. The average water elevation for the quarter for Well 1G and 2G was 11.15 and 12.8 feet msl, respectively. The average water level difference was 1.65 feet in an inward direction.

##### **TL No. 2 (W-3G/W-4G)**

With the exception of approximately 1 week in January, intragradiant conditions were maintained at TL No. 2 in the refuse unit throughout the quarter. The average quarterly water elevation for Wells 3G (inside) and 4G (outside) was 10.67 and 11.09 feet msl,

respectively. The difference in the average head elevations between the two wells was approximately 0.42 feet in an inward direction.

#### **TL No. 3 (W-5G/W-6G)**

Based on the Troll data collected, intragradient conditions were maintained at TL No. 3 in the refuse unit throughout the quarter. The average quarterly water elevation for Wells 5G (inside) and 6G (outside) was 10.74 and 13.20 feet msl, respectively. The head elevation difference between the two wells was approximately 2.46 feet in an inward direction.

#### **TL No. 4 (W-15G/W-13G) Oil Seeps Area**

Intragradient conditions were maintained across the extended slurry wall around the Oil Seeps Area in the refuse unit throughout the quarter. The average quarterly water elevation for Wells 15G (inside) and 13G (outside) was 0.45 and 6.65 feet msl, respectively. The average head elevation difference between the two wells was approximately 6.2 feet in an inward direction.

#### **TL No. 5 (W-9G/W-10G)**

Intragradient conditions were maintained at TL No. 5 in the refuse unit throughout the quarter. The average quarterly water elevation for Wells 9G (inside) and 10G (outside) was 7.16 and 8.10 feet msl, respectively. The average head elevation difference between the two wells was approximately 0.94 feet in an inward direction.

### **3.2 Assessment of Hydraulic Conditions in the Sand & Gravel Unit**

Hydrographs 6 through 9 located in Appendix A show the continuous water levels in the sand & gravel wells at TL Nos. 2 through 4. The water levels in the wells on the outside of the slurry wall vary significantly over the course of the day due to the tidal influence at the site. For clarity, Hydrographs 6 through 9 show the average water level in the well over a 24-hour period (12 hours before and 12 hour after). The heavier weight line on the hydrograph denotes wells located outside the slurry wall.

#### **TL No. 2 (W-3S/W-4S)**

Intragradient conditions were evident throughout the quarter, although there were intermittent periods where such conditions were not maintained. Water levels in Well 3S (inside) ranged from approximately -1.23 to 2.41 feet msl, with a quarterly average of 0.89 feet msl. Water levels in Well 4S (outside) ranged from approximately -0.86 to 3.25 feet msl, with a quarterly average of 1.05 feet msl. The difference in the average

head elevations between the two wells was approximately 0.16 feet in an inward direction.

#### **TL No. 3 (W-5S/W-6S)**

Intragradient conditions were maintained at TL No. 3 in the sand & gravel unit throughout the quarter. The average quarterly water elevation for Wells 5S (inside) and 6S (outside) was 1.32 and 1.71 feet msl, respectively. The head elevation difference between the two wells was approximately 0.39 feet in an inward direction.

#### **TL No. 4 (W-7S/W-8S)**

Intragradient conditions were maintained at TL No. 4 in the sand & gravel unit throughout the quarter. The average quarterly water elevation for Wells 7S (inside) and 8S (outside) was 1.9 and 2.5 feet msl, respectively. The head elevation difference between the two wells was approximately 0.6 feet in an inward direction.

#### **TL No. 4 (W-15S/W-13S) Oil Seeps Area**

Due to an upward gradient between the sand & gravel and refuse units in the oil seeps area, groundwater was not collected from the sand & gravel unit. Hydrograph 9 shows the ambient conditions between Wells W-15S (outside) and W-13S (inside) in the sand & gravel unit and, as anticipated, no significant elevation differences (the slurry wall in this area extends only into the meadow mat) were noted.

### **3.3 Assessment of Vertical Hydraulic Gradients**

Hydrographs 10 through 15 located in Appendix A, show the continuous water levels in the sand & gravel and bedrock wells at TL Nos. 2 through 4. The water levels in the bedrock wells vary significantly over the course of the day due to the tidal influence at the site. For clarity, the hydrographs show the average water level in the well over a 24-hour period (12 hours before and 12 hours after). The heavier weight line on the hydrograph denotes wells located in the bedrock unit.

On average, upward gradient conditions between the bedrock and the overlying sand & gravel deposits were maintained at all of the TL throughout the quarter with the exception of TL No. 2 on the outside of the slurry wall. A detailed analysis of each of the TL is provided below.

#### **TL No. 2 (W-3S/W-3RR) – Inside (W-4S/W-4R) - Outside**

The average gradient conditions were generally maintained in an upward direction between the bedrock and overlying sand & gravel units inside the slurry wall at TL No. 2

throughout the quarter. The average quarterly water elevation for Wells 3S (sand & gravel) and 3RR (bedrock) was 0.89 and 0.81 feet msl, respectively.

Outside the slurry wall at TL No. 2, the vertical gradient between the bedrock and overlying sand & gravel units was in a downward direction. The average quarterly water elevation for Wells 4S (sand & gravel) and 4R (bedrock) was 1.05 and 0.81 feet msl, respectively.

#### **TL No. 3 (W-5S/W-5R) – Inside (W-6S/W-6R) - Outside**

Upward gradient conditions were maintained between the bedrock and overlying sand & gravel units inside the slurry wall at TL No. 3 throughout the quarter. The average quarterly water elevation for Wells 5S (sand & gravel) and 5R (bedrock) was 1.32 and 1.53 feet msl, respectively.

Outside the slurry wall at TL No. 3, upward gradient conditions were not maintained between the bedrock and overlying sand & gravel units. The average quarterly water elevation for Wells 6S (sand & gravel) and 6R (bedrock) was 1.71 and 1.66 feet msl, respectively.

#### **TL No. 4 (W-7S/W-7R) – Inside (W-8S/W-8RR) -Outside**

Upward gradient conditions were maintained between the bedrock and overlying sand & gravel units inside the slurry wall at TL No. 4 throughout the quarter. The average quarterly water elevation for Wells 7S (sand & gravel) and 7R (bedrock) was 1.85 and 1.93 feet msl, respectively.

Outside the slurry wall at TL No. 4, upward gradient conditions were maintained between the bedrock and overlying sand & gravel units. The average quarterly water elevation for Wells 8S (sand & gravel) and 8RR (bedrock) was 2.40 and 2.57 feet msl, respectively.

Hydrograph 10 also contains the continuous water level elevations for Well W-15G in the refuse unit. Upward gradient conditions were maintained across the meadow mat between the sand & gravel and refuse units in the Oil Seeps Area throughout the quarter. The average quarterly water elevation for Wells 15S (sand & gravel unit) and 15G (refuse unit) was 2.27 and 0.45 feet msl, respectively. The average head elevation difference between the two wells was approximately 1.82 feet in an upward direction.

### **3.4 OU2 Hydraulic Monitoring**

The synoptic groundwater elevations obtained during the First Quarter of 2001 indicate both upward and downward hydraulic gradients.

Downward hydraulic gradients prevail between the refuse and the underlying sand & gravel. Downward hydraulic gradients were only noted between the overlying sand & gravel and bedrock units at WE-3S/WE-3R on January 29 and February 26; WE-5S/WE-5R on March 21; and GEI-6S/WE-6R on January 29, February 26, and March 21.

## 4 LEACHATE WITHDRAWAL/GROUNDWATER PUMPING

The performance of the site hydraulic controls is largely dependent upon groundwater pumping and leachate withdrawal rates. The design aqueous leachate and groundwater (GW) collection rates called for a ratio of 3:1, groundwater to leachate of 30,000 gpd groundwater, and 10,000 gpd leachate. The collection rates differed from the design rates due to variations between design assumptions and actual site conditions. Collection rates are also adjusted based on changing site and operational conditions.

A groundwater pumping well performance evaluation was conducted in January and February of 2000, to evaluate the performance of the groundwater collection system in the sand and gravel. According to the Groundwater Pumping Well Performance Evaluation Report, prepared by IT Corporation in September 2000, hydraulic control of OU1 can be achieved by pumping S&G-2 and S&G-3 at a combined rate ranging from 10,000 to 15,000 gpd, with S&G-2 pumped at twice the flow rate of S&G-3. Based on the above recommendation, S&G-2 should be pumped at 10,000 gpd and S&G-3 pumped at 5,000 gpd. The long-term extraction rates could be reduced over time to 10,000 gpd or even lower based on the hydraulic monitoring data.

Leachate collection rates should maintain a leachate level low enough to achieve intergradient conditions and high enough to allow for the collection of oil. Based on the operational history, leachate collection rates of 500 to 1,500 gpd are sufficient to maintain intergradient conditions.

Operation records are maintained at the site and contain estimated daily averages for leachate and groundwater withdrawal. The monthly volumes collected and the daily average collection rate are provided below:

Monitoring Period	S&G #1	S&G #2	S&G #3	S&G #4	Leachate
January	136,715 gal.	331,819 gal.	5,481 gal.	0 gal.	14,227gal.
	4,410 gpd	10,704 gpd	177 gpd	0 gpd	458 gpd
February	106,339 gal.	137,858 gal.	100,316 gal.	0 gal.	18,594 gal.
	3,798 gpd	4,923 gpd	3,582 gpd	0 gpd	664 gpd
March	0 gal.	250,500 gal.	65,054 gal.	0 gal.	44,866 gal.
	0 gpd	8,083 gpd	2,099 gpd	0 gpd	1,447 gpd

<b>Monitoring Period</b>	<b>S&amp;G #1</b>	<b>S&amp;G #2</b>	<b>S&amp;G #3</b>	<b>S&amp;G #4</b>	<b>Leachate</b>
<b>Quarter</b>	<b>243,054 gal.</b>	<b>720,177 gal.</b>	<b>170,851 gal.</b>	<b>0 gal.</b>	<b>77,687 gal.</b>
	<b>2,671 gpd</b>	<b>7,914 gpd</b>	<b>1,877 gpd</b>	<b>0 gpd</b>	<b>854 gpd</b>

The volume of groundwater collected in the first quarter is 1,134,082 gallons, and the average daily groundwater withdrawal rate is 12,462 gpd. Groundwater collection rates are generally consistent with recommended extraction rates. Leachate collection rates are also within the recommended extraction rates.

## **5 LANDFILL GAS MIGRATION MONITORING**

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Landfill gas migration monitoring was performed at the operational flare port inlet and the 6 gas migration monitoring wells located along the northern edge of the landfill boundary.

### **5.1 Landfill Gas Migration**

The purpose of the gas migration monitoring program is to monitor for off-site gas migration in those areas where gas migration or accumulation could lead to explosive conditions. Six gas migration monitoring wells are located outside of the circumferential slurry wall along the northern edge of the landfill boundary. The well locations are depicted on Drawing 1 and are spaced in 200-foot increments.

All areas of OU1 exterior to the slurry wall contain waste materials except along the northern edge of the landfill boundary. High levels of gas are not expected to be detected along the northern boundary because the slurry wall will act as an effective barrier, and the presence of an active gas extraction system and the high water table will inhibit gas migration.

Gas monitoring in other areas of the site containing waste materials will likely reveal combustible gas. However, since no on-site OU1 buildings are present (except the leachate treatment facility, which has its own engineered gas monitoring and control system), gas migration monitoring in the waste areas is not required by the O&M manual.

### **5.2 Gas Monitoring Well Results**

Measurements of percent combustible gas (% GAS) and percent lower explosive limit (% LEL) were performed in the 6 gas migration monitoring wells along the northern boundary of the site on February 26, 2001. The wells were monitored in accordance with Attachment 1, Section 3.0 Routine Operations and Maintenance, of the Kin-Buc Landfill Draft O&M Manual (Wheelabrator, 1995). A Landtec GEM 500 sampling device was used to measure the concentration of combustible gas at each well by attaching the meter's sample tubing to the well head petcock and drawing the sample through the meter. Detectable levels of percent combustible gas and percent lower explosive limit

were not detected in any gas monitoring wells. The results of the 6 gas migration monitoring wells are shown in Table 5-1.

### 5.3 Operational Flare Monitoring Results

The percent combustible gas by volume (% methane) at the landfill's operational flare port inlet was recorded throughout the first quarter of 2001. All readings were collected with a Landtec GEM 500 Gas Analyzer, equipped with a charcoal filter. Monitoring performed on February 26, 2001, revealed combustible gas at 35.3 percent at the flare port inlet

The following summarizes the flare station operation during the First Quarter of 2001:

Date	Gas Flow (SCFM)	Methane % by volume
1/4/01	166	39.8
1/29/01	149	47.3
2/12/01	160	39.2
2/27/01	144	40.7
3/12/01	120	44.7
3/26/01	138	40.1
Averages for Fourth Quarter	146.2	42.0

**Note:** Flare station data provided by Landfill personal.

## 6 CONCLUSIONS

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Significant conclusions for the first quarter of 2001 monitoring program are as follows:

- In the refuse unit, intragradient conditions were maintained over the entire quarter at all of the TLs with the exception of TL No. 2. For approximately 1 week in January, intragradient conditions were not maintained at TL No. 2. However, the average of water levels over the quarter indicated intragradient conditions.
- Intragradient conditions in the refuse unit over the quarter were maintained with an average daily leachate extraction rate of 854 gpd. The January average daily leachate extraction rate of 458 gpd was lower than the quarterly average. Based on the quarterly monitoring results, a leachate collection rate should be maintained above 500 gpd in each month.
- In the sand and gravel, intragradient conditions were maintained at TLs No. 3 and 4 over the entire quarter, although at TL No. 2 there were intermittent periods where intragradient conditions were not maintained. However, the average of water levels over the quarter was intragradient.
- An upward gradient across the meadow mat (between the sand & gravel and refuse units) was imposed at TL No. 4 in the Oil Seeps Area by leachate collection; therefore, intragradient conditions do not need to be maintained in the sand & gravel unit.
- Upward hydraulic gradients were maintained at TL No. 3 inside the slurry wall and at TL No. 4 both inside and outside the slurry wall. At TL No. 2 inside the slurry wall there were intermittent periods where upward gradient conditions were not maintained. At TL Nos. 2 and 3 outside the slurry wall, upward conditions were not maintained.
- The volume and rate of groundwater collection was consistent with recommended levels. However, to optimize the hydraulic performance, S&G-2 should be pumped at twice the flow rate of S&G-3.
- Combustible gas as a percent of total gas and the lower explosive limit was not detected in the 6 monitoring wells located on the northern boundary of the site.

The flare was operational and the percent methane at the flare port inlet was 35.5 percent. Based on the non-detection of combustible gas in the monitoring wells, the active gas collection system is functioning properly and there is no off-site gas migration.

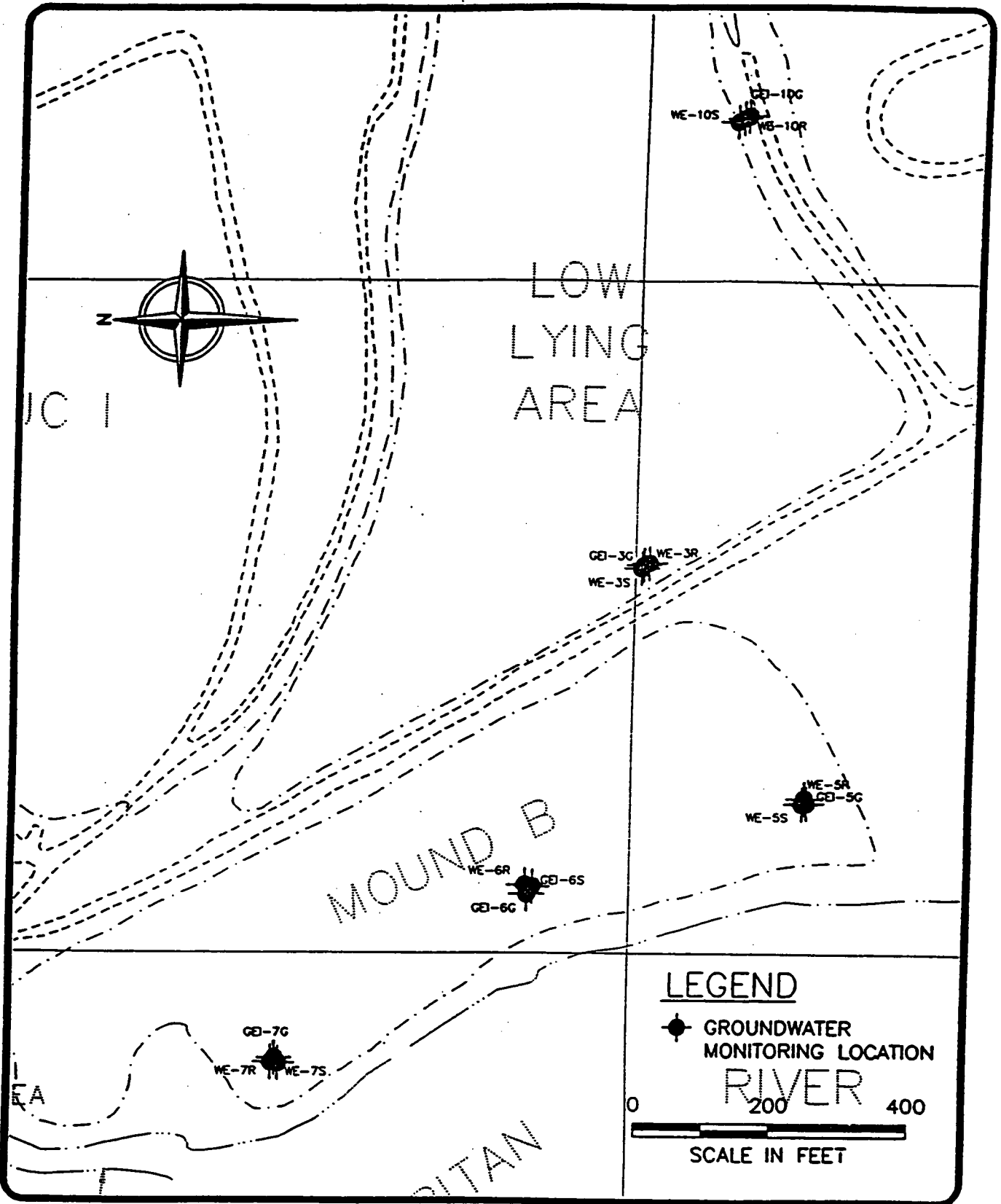
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- Final Addendum 1 to the Proposed Groundwater Monitoring Plan for the Kin-Buc Landfill Operable Unit 1 Closure Plan Re: OU2 Groundwater and Surface Water Monitoring, Wehran Engineering Corporation, Middletown, New York, August 1994.
- Draft Operations and Maintenance Manual for the Kin-Buc Landfill, Wheelabrator EOS, Inc., Pittsburgh, PA, August 1995.
- Remedial Action Report for Operable Unit 2 for the Kin-Buc Landfill Superfund Site, Blasland, Bouck & Lee, Inc., January 1996.
- Appendix C Groundwater, Surface Water, Wetlands and Biota Monitoring Plans for the Kin-Buc Landfill Operable Units 1 and 2, Wheelabrator EOS, Inc., Pittsburgh, PA, August 1995.
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- Draft Remedial Investigation Report for Kin-Buc Landfill Operable Unit 2, Wehran Engineering Corporation, Middletown, New York, October 1990.
- Influent Equalization Logs, (Wheelabrator), Inc., Kin-Buc Landfill Treatment Plant, January 1997, February 1997, March 1997.
- Kin-Buc Landfill Leachate Treatment Plant Operation and Site Post-Closure Care, Monthly Reports, Wheelabrator EOS, April, May, June 1997.
- Groundwater Pumping Well Performance Evaluation Report, IT Corporation, July 2000.

**Figure**

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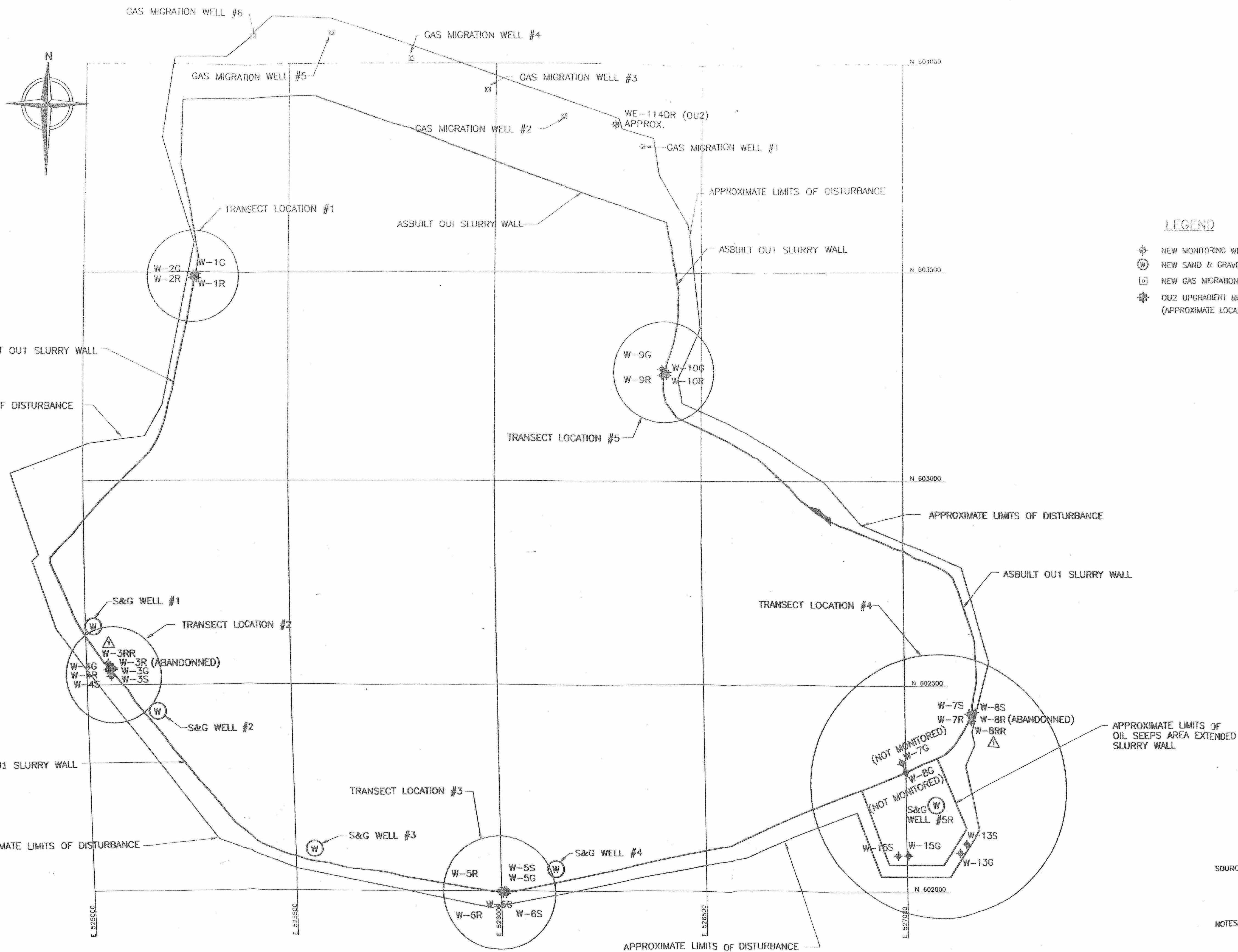


DATE \_\_\_\_\_  
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 REV \_\_\_\_\_

KINBUC LANDFILL  
 EDISON TOWNSHIP, NEW JERSEY  
 OU2 GROUNDWATER  
 MONITORING LOCATIONS

FIGURE  
 1-1  
 PROJECT NO.  
 12568-001.000

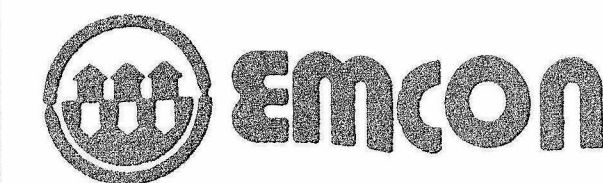
**Drawing**



SOURCE: BASEMAP DATA TAKEN FROM PLAN SHEET 10A OF MAP ENTITLED "KIN-BUC LANDFILL FINAL WELL LOCATION PLAN" PREPARED BY CONTI ENVIRONMENTAL INC. DATED JULY 17, 1995.

- NOTES:
1. THE MONITORING WELL LOCATIONS W-7G, W-8G, W-13G, W-13S, W-15G, AND W-15S ARE APPROXIMATE.
  2. MONITORING WELL W-8R IS DAMAGED AND NOT SERVICABLE AS A WATER QUALITY MONITORING POINT.
  3. MONITORING WELLS W-7G AND W-8G REPLACED BY W-15G AND W-13G.
  4. MONITORING WELLS W-8R AND W-3R ABANDONED AND REPLACED BY NEW MONITORING WELLS W-8RR AND W-3RR RESPECTIVELY.

REV	DATE	DESCRIPTION	DRN BY	DES BY	CHK BY	APP BY
1	2/99	ADD NEW WELLS				
2	5/99	DATE OF ISSUE	DRN BY	DES BY	CHK BY	APP BY
			SDI	BD		



KIN-BUC LANDFILL  
EXISTING GROUNDWATER MONITORING PLAN  
EDISON TOWNSHIP, NEW JERSEY

OPERABLE UNIT 1 MONITORING NETWORK

## TABLES

**Table 2-1**

**Kin-Buc Landfill  
Operable Unit 1  
Continuous Hydraulic Monitoring Well Network/Transects**

<b>Transect Location No.</b>	<b>Screened Hydrogeologic Unit</b>	<b>Well Location Inside Slurry Wall</b>	<b>Well Location Outside Slurry Wall</b>
1	Refuse/Fill	W-1G	W-2G
2	Refuse/Fill	W-3G	W-4G
	Sand and Gravel	W-3S	W-4S
	Bedrock	W-3RR	W-4R
3	Refuse/Fill	W-5G	W-6G
	Sand and Gravel	W-5S	W-6S
	Bedrock	W-5R	W-6R
4	Refuse/Fill <sup>(1)</sup>	W-15G	W-13G
	Sand and Gravel <sup>(1)</sup>	W-15S	W-13S
	Sand and Gravel <sup>(2)</sup>	W-7S	W-8S
	Bedrock <sup>(2)</sup>	W-7R	W-8RR
5	Refuse/Fill	W-9G	W-10G

Notes: <sup>(1)</sup> Wells located across the extended slurry wall.  
<sup>(2)</sup> Wells located across the OU1 circumferential slurry wall.

**Table 2-2**

**Kin-Buc Landfill  
Operable Unit 2  
Hydraulic Monitoring Network**

<b>Well Location</b>	<b>Screened Hydrogeologic Unit</b>
<b>Low-Lying Area</b>	
GEI-10G	Fill/Refuse
WE-10S	Sand & Gravel
WE-10R	Bedrock
GEI-3G	Fill/Refuse
WE-3S	Sand & Gravel
WE-3R	Bedrock
<b>Mound B</b>	
GEI-5G	Fill/Refuse
WE-5S	Sand & Gravel
WE-5R	Bedrock
GEI-6G	Fill/Refuse
GEI-6S	Sand & Gravel
WE-6R	Bedrock
GEI-7G	Fill/Refuse
WE-7S	Sand & Gravel
WE-7R	Bedrock
<b>Upgradient</b>	
WE-114DR	Bedrock

**Table 2-3**  
**KinBuc Landfill Operable Units 1 and 2**  
**Modified Monitoring Program**  
**First Quarter 2001**  
**Manually Recorded Water Level Elevations**

Well ID	TOC Bottom	TOC Ref Elevation	January 29, 2001		February 26, 2001		March 21, 2001	
			TOC Static	Elevation	TOC Static	Elevation	TOC Static	Elevation
<b>OU1</b>								
W-1G	20.50	30.78	19.73	11.05	19.58	11.20	19.78	11.00
W-1R	35.34	30.79	21.10	9.69	20.73	10.06	20.93	9.86
W-2G	20.83	30.77	18.22	12.55	18.34	12.43	17.80	12.97
W-2R	35.33	30.64	24.11	6.53	23.79	6.85	23.94	6.70
W-3G (oil)	19.07	20.73	10.19	10.54	10.20	10.53	10.00	10.73
W-3G	19.07	20.73	12.72	8.01	10.97	9.76	10.59	10.14
W-3S	31.48	20.79	20.96	-0.17	19.70	1.09	19.49	1.30
W-3RR	54.40	21.16	21.33	-0.17	20.05	1.11	20.18	0.98
W-4G	17.57	20.23	9.18	11.05	8.92	11.31	9.05	11.18
W-4S	31.58	19.71	19.05	0.66	18.42	1.29	18.62	1.09
W-4R	54.92	20.61	20.17	0.44	19.21	1.40	19.65	0.96
W-5G	24.36	23.94	13.19	10.75	13.19	10.75	13.03	10.91
W-5S	30.33	24.33	22.97	1.36	22.71	1.62	22.60	1.73
W-5R	41.64	24.11	22.85	1.26	22.55	1.56	22.48	1.63
W-6G	23.99	23.69	10.55	13.14	10.56	13.13	10.33	13.36
W-6S	38.49	24.00	22.51	1.49	22.26	1.74	22.21	1.79
W-6R	50.43	23.99	22.50	1.49	22.27	1.72	22.17	1.82
W-7G	19.91	18.30	6.65	11.65	6.75	11.55	7.46	10.84
W-7S	29.34	11.61	10.05	1.56	9.75	1.86	9.69	1.92
W-7R	45.13	11.05	9.37	1.68	9.07	1.98	9.01	2.04
W-8S	28.86	10.92	8.69	2.23	8.52	2.40	8.63	2.29
W-8RR	41.60	9.51	7.31	2.20	7.16	2.35	7.21	2.30
W-9G	21.93	27.34	20.18	7.16	20.25	7.09	20.14	7.20
W-9R	39.05	27.68	21.43	6.25	21.55	6.13	21.41	6.27
W-10G	22.56	27.43	19.33	8.10	19.36	8.07	19.26	8.17
W-10R	34.01	27.43	19.68	7.75	19.72	7.71	19.63	7.80
W-13G	10.30	10.17	3.65	6.52	3.55	6.62	3.50	6.67
W-13S	29.32	10.10	8.08	2.02	7.90	2.20	7.96	2.14
W-15G <sup>(1)</sup>	16.99	16.18	15.34	0.84	15.30	0.88	15.35	0.83
W-15S	33.36	16.05	13.98	2.07	13.80	2.25	13.80	2.25
<b>OU2</b>								
GEI-10G	13.91	13.65	0.88	12.77	1.28	12.37	0.71	12.94
WE-10S	29.57	14.99	13.57	1.42	13.35	1.64	13.10	1.89
WE-10R	41.74	13.96	12.50	1.46	12.28	1.68	12.05	1.91
GEI-3G	13.54	16.73	3.85	12.88	3.81	12.92	3.54	13.19
WE-3S	25.67	15.12	14.23	0.89	13.96	1.16	13.69	1.43
WE-3R	46.51	14.99	14.27	0.72	14.05	0.94	13.63	1.36
GEI-5G	14.60	16.08	9.56	6.52	9.23	6.85	9.06	7.02
WE-5S	25.84	15.04	14.28	0.76	14.14	0.90	13.53	1.51
WE-5R	49.64	15.31	14.60	0.71	14.41	0.90	13.95	1.36
GEI-6G	14.97	19.76	11.94	7.82	11.70	8.06	11.57	8.19
GEI-6S	43.67	20.99	20.81	0.18	20.78	0.21	19.05	1.94
WE-6R	47.12	19.62	19.82	-0.20	19.58	0.04	18.52	1.10
GEI-7G	13.74	17.23	DRY	<3.49	DRY	<3.49	DRY	<3.49
WE-7S	30.07	15.86	16.04	-0.18	15.67	0.19	14.99	0.87
WE-7R	72.88	15.93	15.13	0.80	14.90	1.03	14.87	1.06
WE-114DR	44.84	23.76	17.67	6.09	17.17	6.59	17.25	6.51

NOTE:

(1) All level, reference, bottom measurements recorded to the top of PVC inner casing.

**Table 2-4**  
**KinBuc Landfill Operable Units 1 and 2**  
**Continuous Hydraulic Monitoring Results**  
**2001 Minimum/Maximum Water Elevations**

Inside Slurry Wall					Outside Slurry Wall				
Well ID	Monitoring Month	Minimum Recorded Water Elevation	Maximum Recorded Water Elevation	Average Water Elevation	Well ID	Monitoring Month	Minimum Recorded Water Elevation	Maximum Recorded Water Elevation	Average Water Elevation
W-1G	January	11.09	11.28	11.14	W-2G	January	11.35	12.96	11.85
	February	11.09	11.22	11.16		February	12.32	13.38	12.80
	March	11.09	11.23	11.16		March	13.06	14.38	13.77
	1st Quarter	11.09	11.28	11.15		1st Quarter	11.35	14.38	12.81
W-3G	January	10.67	11.09	10.67	W-4G	January	10.55	11.42	10.81
	February	10.62	11.03	10.61		February	10.76	11.46	11.14
	March	10.77	11.23	10.77		March	10.95	11.70	11.32
	1st Quarter	10.62	11.23	10.67		1st Quarter	10.55	11.70	11.09
W-3S	January	-1.23	20.60	0.40	W-4S	January	-0.86	2.53	0.80
	February	-0.97	1.92	0.68		February	-0.74	2.32	0.85
	March	0.61	2.41	1.56		March	-0.08	3.25	1.48
	1st Quarter	-1.23	2.41	0.89		1st Quarter	-0.86	3.25	1.05
W-5G	January	10.41	11.31	10.70	W-6G	January	na*	na*	na*
	February	10.36	11.12	10.70		February	12.94	13.26	13.09
	March	10.45	11.45	10.81		March	12.65	13.86	13.20
	1st Quarter	10.36	11.45	10.74		1st Quarter	12.65	13.86	13.20
W-5S	January	0.09	2.05	1.10	W-6S	January	0.62	2.42	1.57
	February	0.33	1.90	1.13		February	0.70	2.30	1.51
	March	0.89	2.48	1.71		March	1.23	2.82	2.04
	1st Quarter	0.09	2.48	1.32		1st Quarter	0.62	2.82	1.71
W-7S	January	0.79	2.43	1.63	W-8S	January	1.67	3.60	2.31
	February	1.03	2.39	1.70		February	1.74	3.78	2.28
	March	1.52	2.91	2.21		March	1.94	4.92	2.59
	1st Quarter	0.79	2.91	1.85		1st Quarter	1.67	4.92	2.40
W-15S	January	1.38	2.80	2.11	W-13S	January	1.40	2.82	2.10
	February	1.60	2.85	2.13		February	1.52	2.99	2.09
	March	1.94	3.46	2.54		March	1.83	3.83	2.45
	Average	1.38	3.46	2.27		1st Quarter	1.40	3.83	2.22
W-15G	January	0.06	0.59	0.47	W-13G	January	6.15	7.00	6.51
	February	0.32	0.58	0.43		February	6.43	7.08	6.67
	March	0.38	0.57	0.46		March	6.54	7.16	6.76
	1st Quarter	0.06	0.59	0.45		1st Quarter	6.15	7.16	6.65
W-9G	January	6.73	7.50	7.07	W-10G	January	7.89	8.12	7.98
	February	6.85	7.49	7.15		February	8.03	8.19	8.12
	March	7.01	7.65	7.28		March	8.10	8.32	8.22
	1st Quarter	6.73	7.65	7.16		1st Quarter	8.03	8.32	8.10

Note: \* Troll water level data was not collected from 1/1/01 to 2/26/01 due to Troll malfunction.

**Table 2-4**  
**KinBuc Landfill Operable Units 1 and 2**  
**Continuous Hydraulic Monitoring Results**  
**2001 Minimum/Maximum Water Elevations**

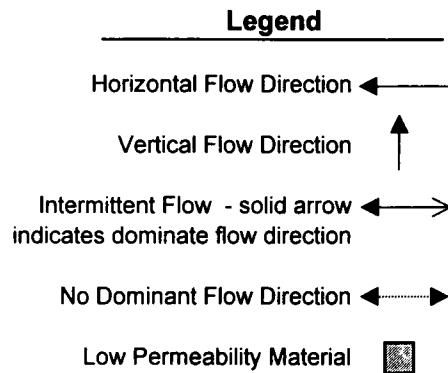
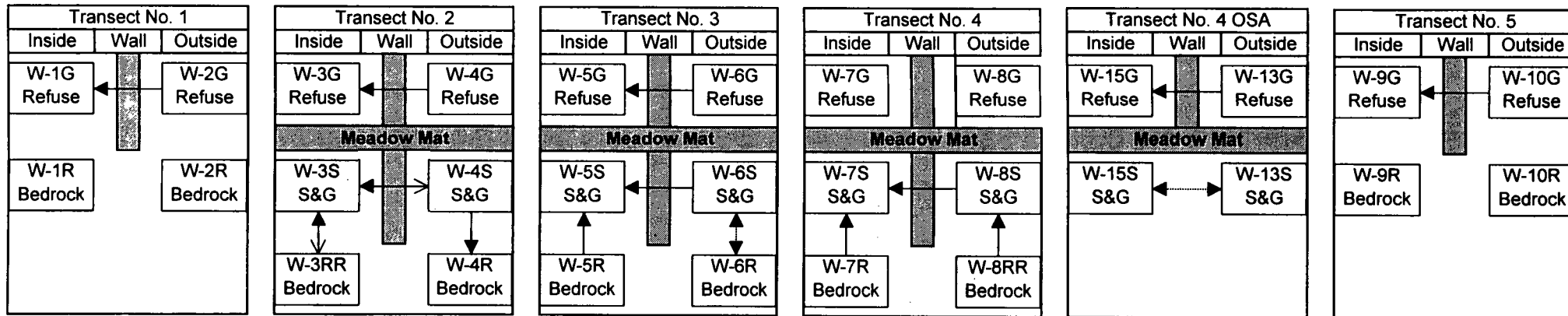
Inside Slurry Wall					Outside Slurry Wall				
Well ID	Monitoring Month	Minimum Recorded Water Elevation	Maximum Recorded Water Elevation	Average Water Elevation	Well ID	Monitoring Month	Minimum Recorded Water Elevation	Maximum Recorded Water Elevation	Average Water Elevation
W-3RR	January	-1.31	2.40	0.50	W-4R	January	-1.26	2.44	0.57
	February	-1.12	2.28	0.63		February	-1.15	2.26	0.63
	March	0.40	2.86	1.21		March	-0.48	3.02	1.12
	1st Quarter	-1.31	2.86	0.81		1st Quarter	-1.26	3.02	0.81
W-5R	January	0.30	2.28	1.31	W-6R	January	0.47	2.39	1.47
	February	0.56	2.10	1.33		February	0.67	2.26	1.47
	March	1.09	2.70	1.93		March	1.22	2.80	2.02
	1st Quarter	0.30	2.70	1.53		1st Quarter	0.47	2.80	1.66
W-7R	January	0.88	2.50	1.71	W-8RR	January	1.83	3.76	2.48
	February	1.12	2.44	1.78		February	1.91	3.95	2.45
	March	1.61	2.98	2.29		March	2.13	5.11	2.77
	1st Quarter	0.88	2.98	1.93		1st Quarter	1.91	5.11	2.57

Note: \* Troll water level data was not collected from 1/1/01 to 2/26/01 due to Troll malfunction.

**Table 2-5**  
**KinBuc Landfill Operable Unit 1**  
**First Quarter 2001**  
**Troll Water Level Elevations vs. Manual Water Elevations**

OU 1 Well ID	January 29			February 26			March 21			Average Difference
	Troll	Manual	Difference	Troll	Manual	Difference	Troll	Manual	Difference	
W-1G	11.18	11.05	0.13	11.18	11.20	-0.02	11.17	11.00	0.17	0.09
W-2G	12.53	12.55	-0.02	12.49	12.43	0.06	13.66	12.97	0.69	0.24
W-3G	10.74	10.54	0.20	10.68	10.53	0.15	10.92	10.73	0.19	0.18
W-3S	-0.13	-0.17	0.04	1.05	1.09	-0.04	1.23	1.30	-0.07	-0.02
W-3RR	-0.14	-0.17	0.03	1.19	1.11	0.08	1.13	0.98	0.15	0.09
W-4G	11.01	11.05	-0.04	11.32	11.31	0.01	11.19	11.18	0.01	-0.01
W-4S	0.75	0.66	0.09	1.36	1.29	0.07	1.19	1.09	0.10	0.09
W-4R	0.49	0.44	0.05	1.29	1.40	-0.11	0.80	0.96	-0.16	-0.07
W-5G	10.72	10.75	-0.03	10.74	10.75	-0.01	10.89	10.91	-0.02	-0.02
W-5S	1.07	1.36	-0.29	1.32	1.62	-0.30	1.45	1.73	-0.28	-0.29
W-5R	1.26	1.26	0.00	1.53	1.56	-0.03	1.64	1.63	0.01	-0.01
W-6S	1.55	1.49	0.06	1.74	1.74	0.00	1.82	1.79	0.03	0.03
W-6R	1.44	1.49	-0.05	1.68	1.72	-0.04	1.80	1.82	-0.02	-0.04
W-7S	1.55	1.56	-0.01	1.83	1.86	-0.03	1.92	1.92	0.00	-0.01
W-7R	1.62	1.68	-0.06	1.90	1.98	-0.08	1.99	2.04	-0.05	-0.06
W-8S	2.17	2.23	-0.06	2.35	2.40	-0.05	2.28	2.29	-0.01	-0.04
W-8RR	2.33	2.20	0.13	2.52	2.35	0.17	2.45	2.30	0.15	0.15
W-9G	7.14	7.16	-0.02	7.06	7.09	-0.03	7.29	7.20	0.09	0.01
W-10G	8.08	8.10	-0.02	8.04	8.07	-0.03	8.23	8.17	0.06	0.00
W-13G	6.58	6.52	0.06	6.73	6.62	0.11	6.75	6.67	0.08	0.08
W-13S	2.01	2.02	-0.01	2.27	2.20	0.07	2.17	2.14	0.03	0.03
W-15G	0.38	0.84	-0.46	0.43	0.88	-0.45	0.50	0.83	-0.33	-0.41
W-15S	2.09	2.07	0.02	2.29	2.25	0.04	2.32	2.25	0.07	0.04

**Figure 3-1**  
**Kin-Buc Landfill**  
**First Quarter Hydraulic Profile Summary**



**Table 5-1**

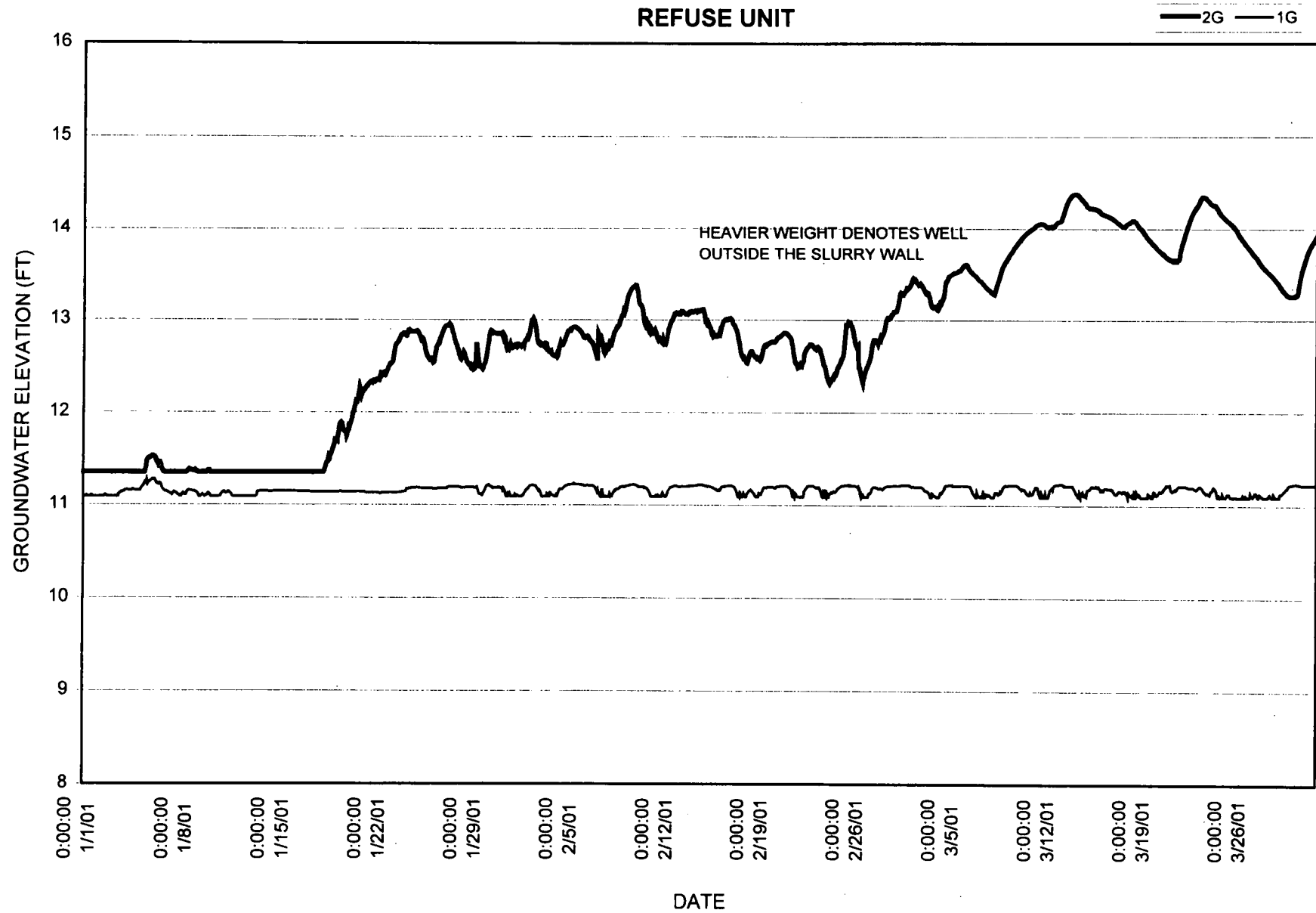
**Kin-Buc Landfill  
Operable Unit 1  
First Quarter 2000 Modified Program  
Gas Monitoring Well Network/Results**

Well (Network) Location	Monitoring Result	
	% LEL	% GAS
GMW-01	0	0
GMW-02	0	0
GMW-03	0	0
GMW-04	0	0
GMW-05	0	0
GMW-06	0	0
Operational Flare Inlet	NA	49.1

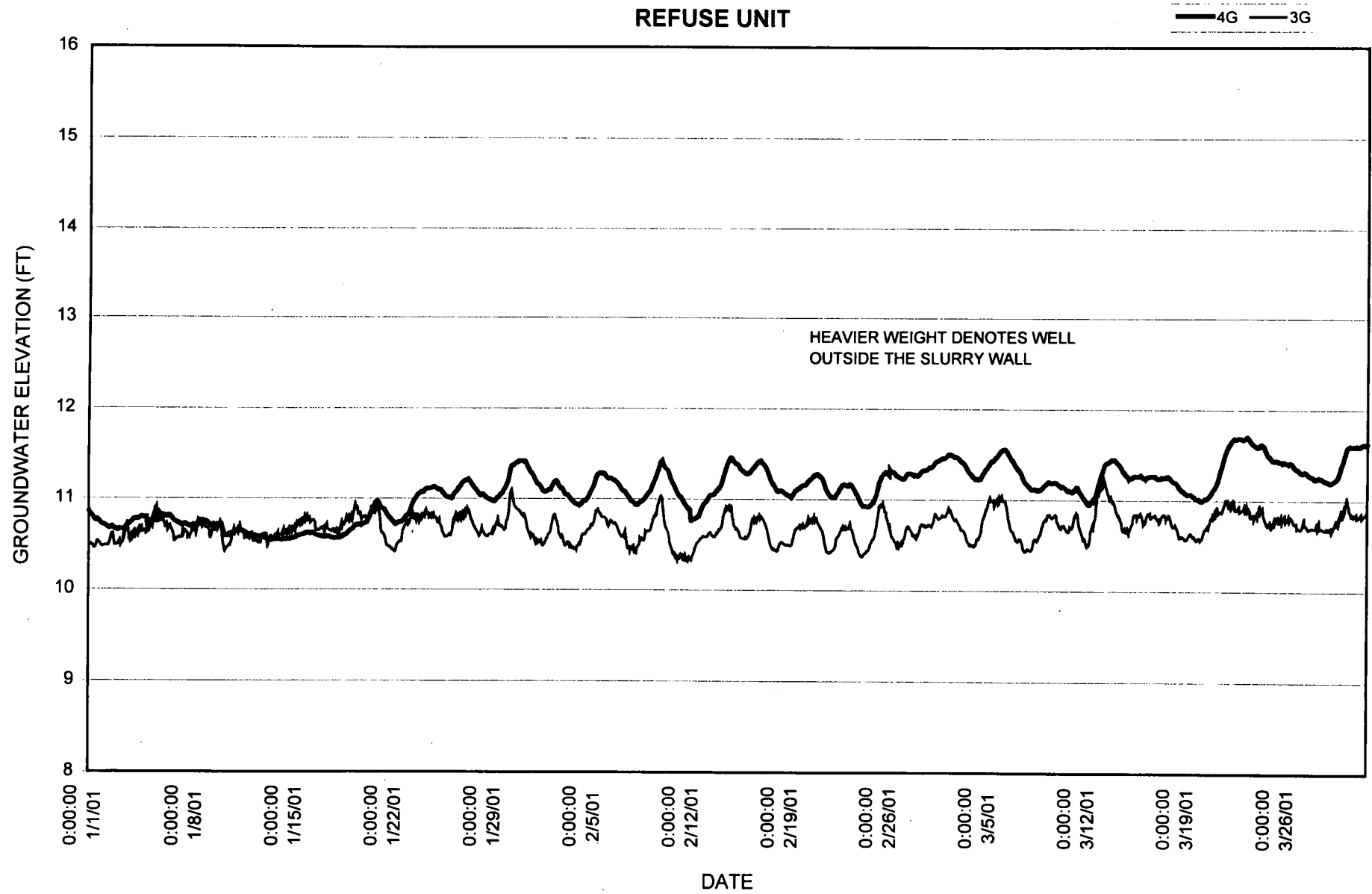
**APPENDIX A**

**OU1 REFUSE WELLS CONTINUOUS WATER LEVEL MONITORING  
RESULTS**

KIN-BUC LANDFILL GROUNDWATER HYDROGRAPH #1  
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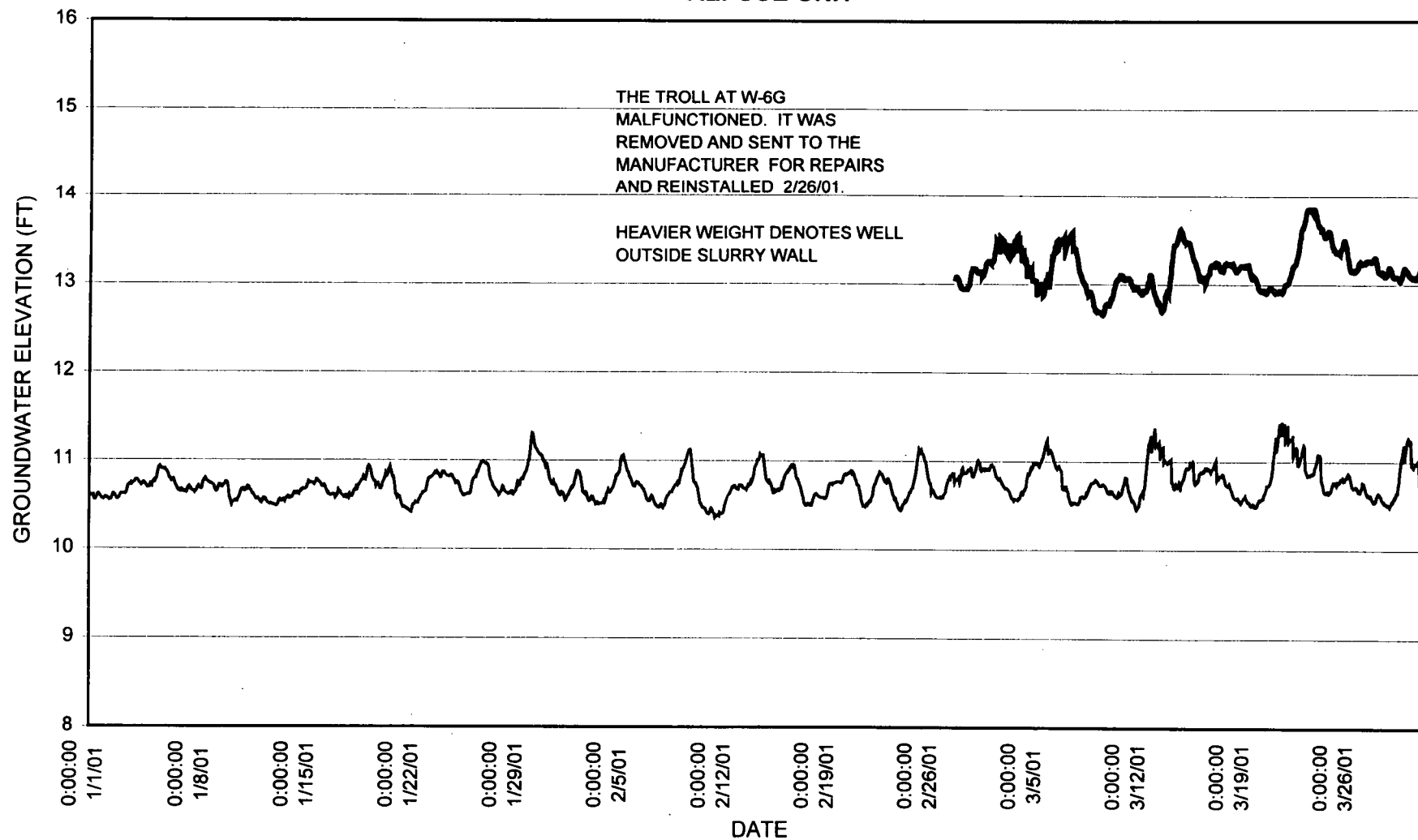


KIN-BUC LANDFILL GROUNDWATER HYDROGRAPH #2  
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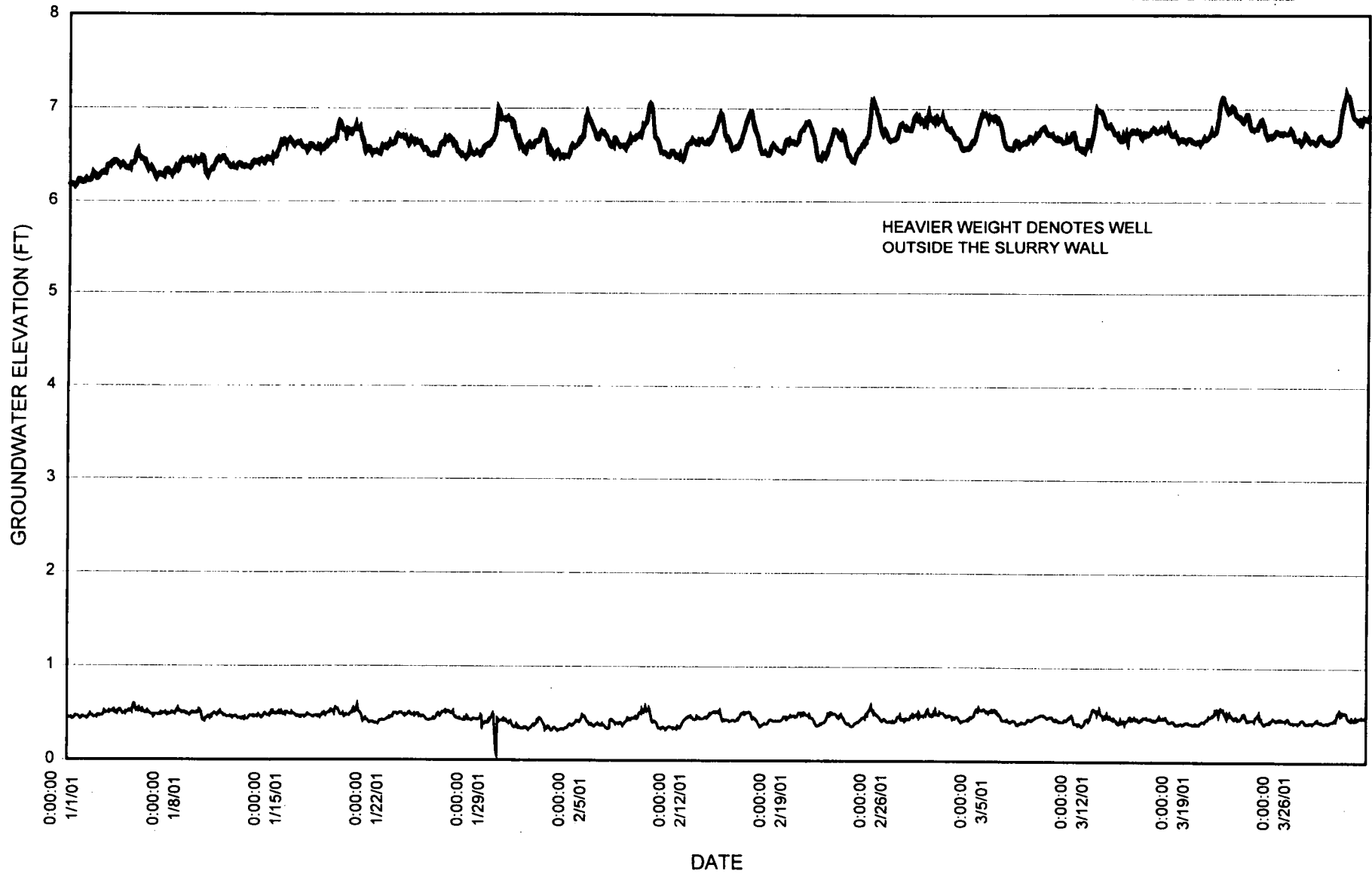
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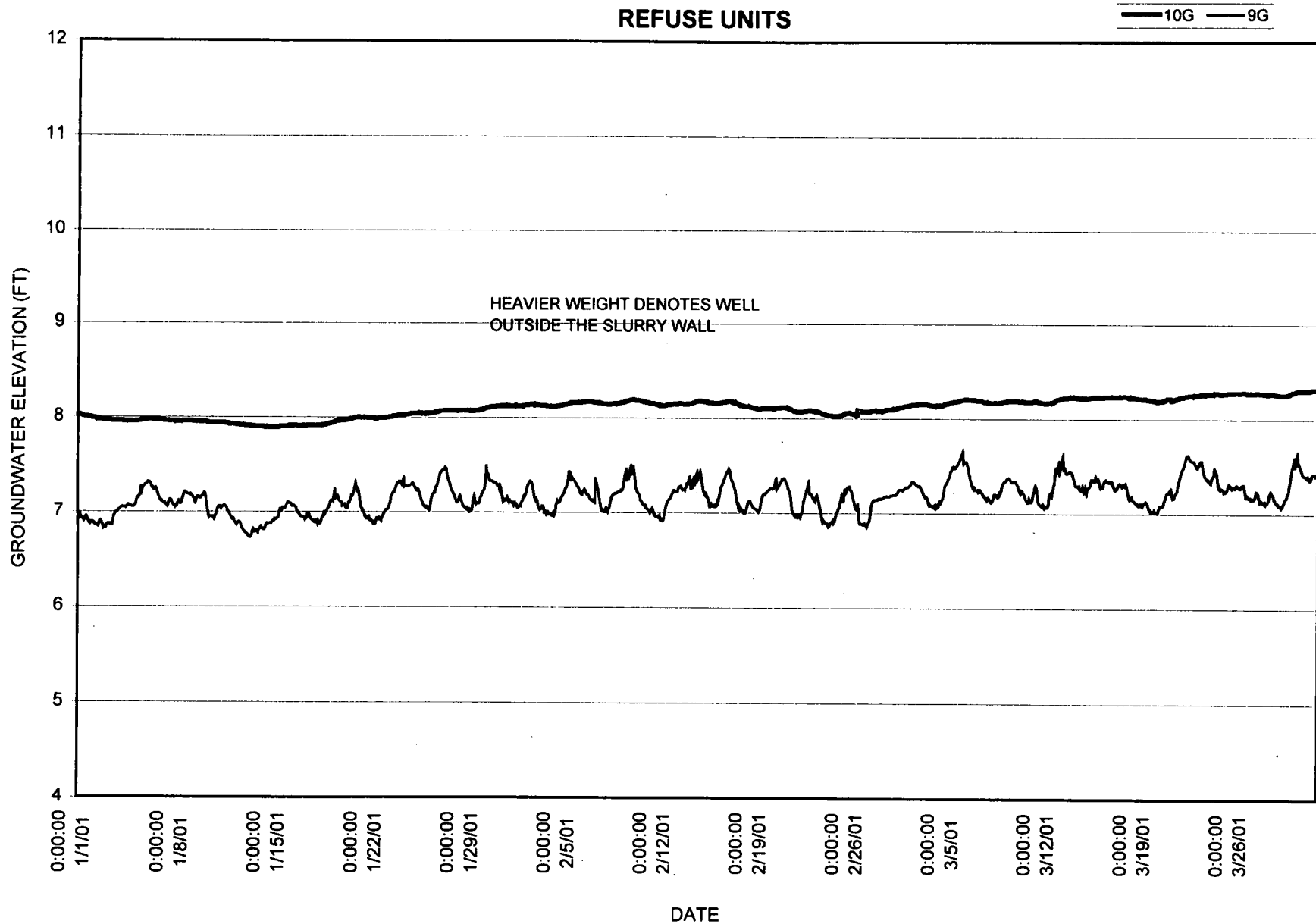


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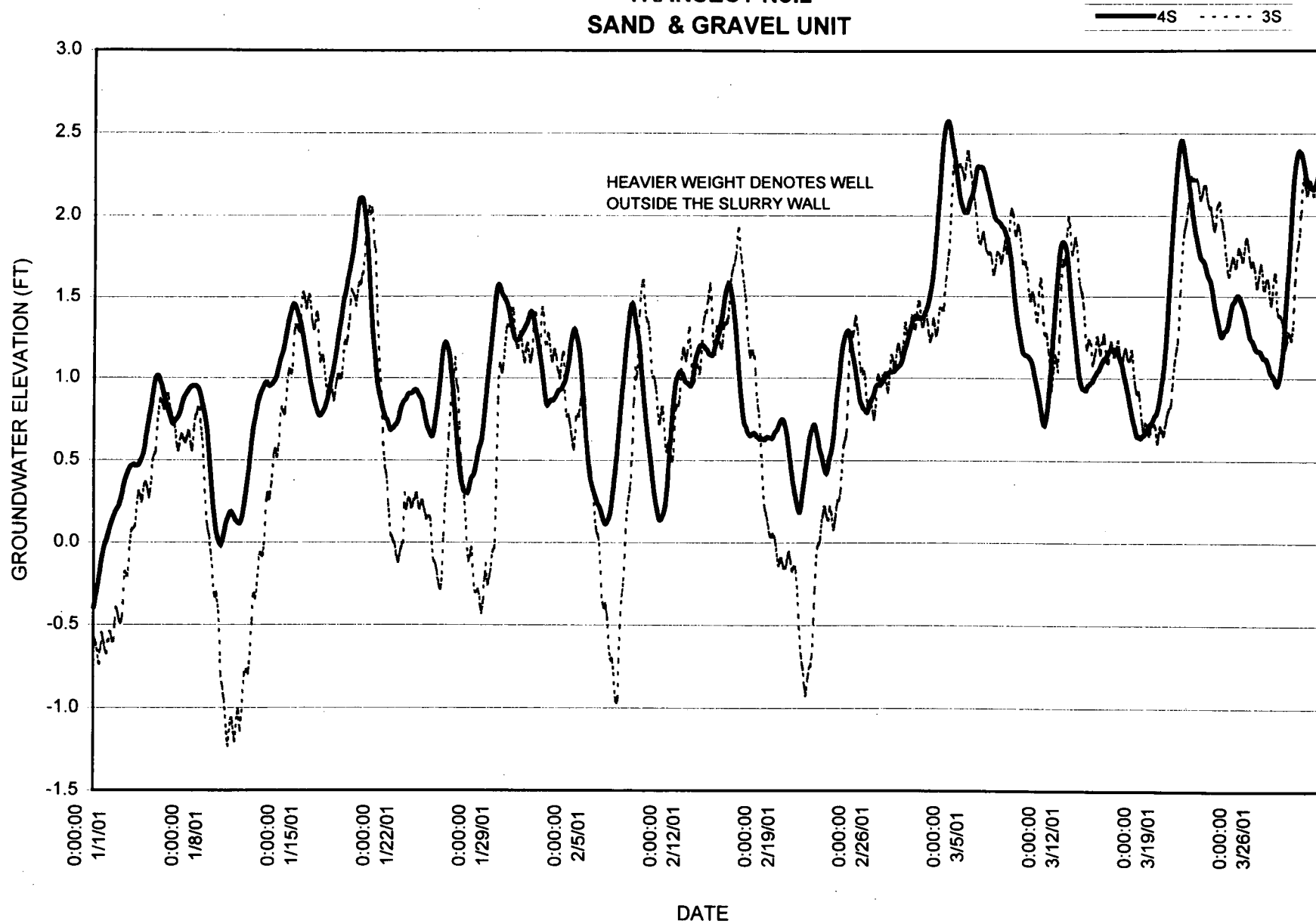
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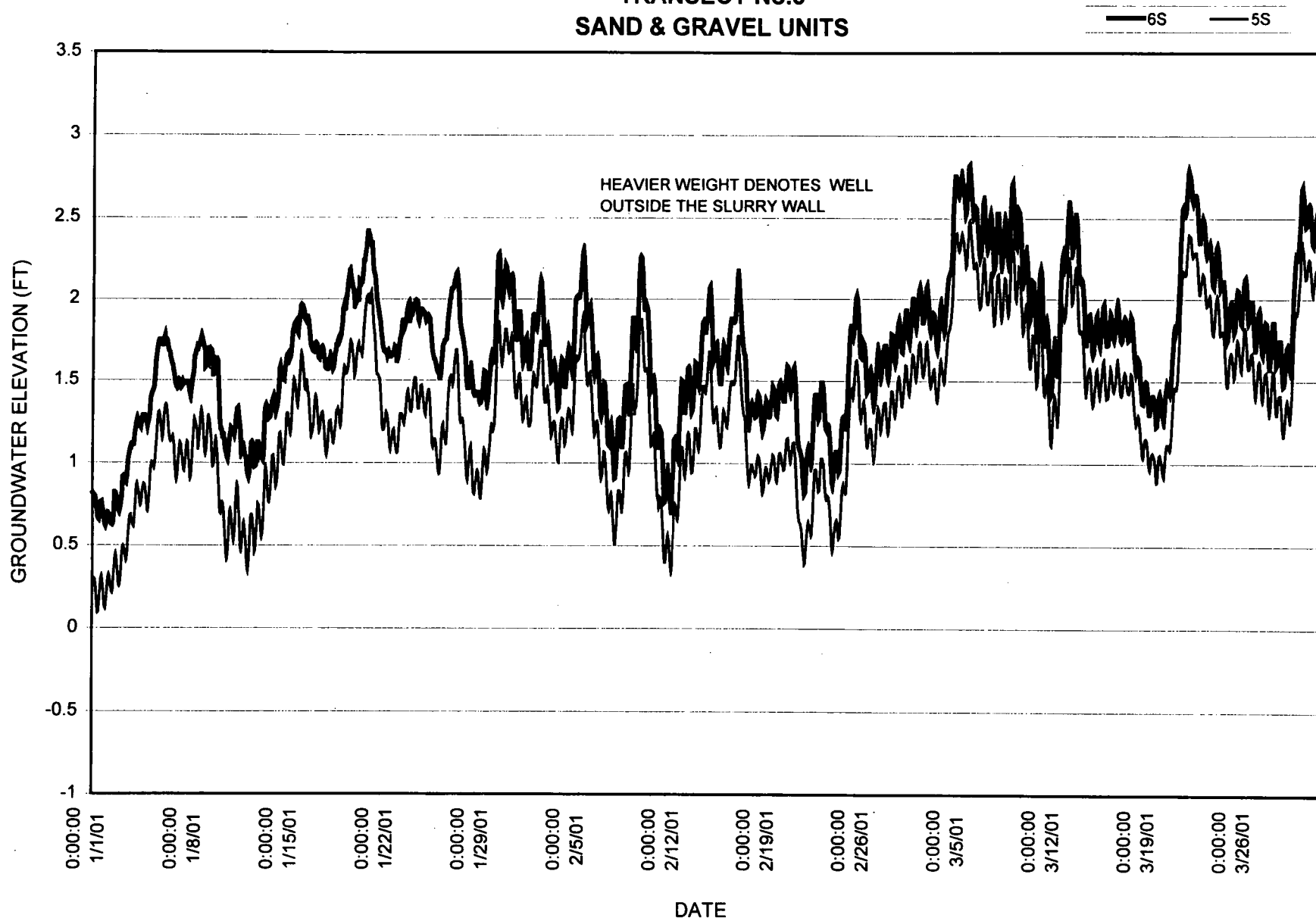
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TRANSECT No.5  
REFUSE UNITS



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TRANSECT No.2  
SAND & GRAVEL UNIT

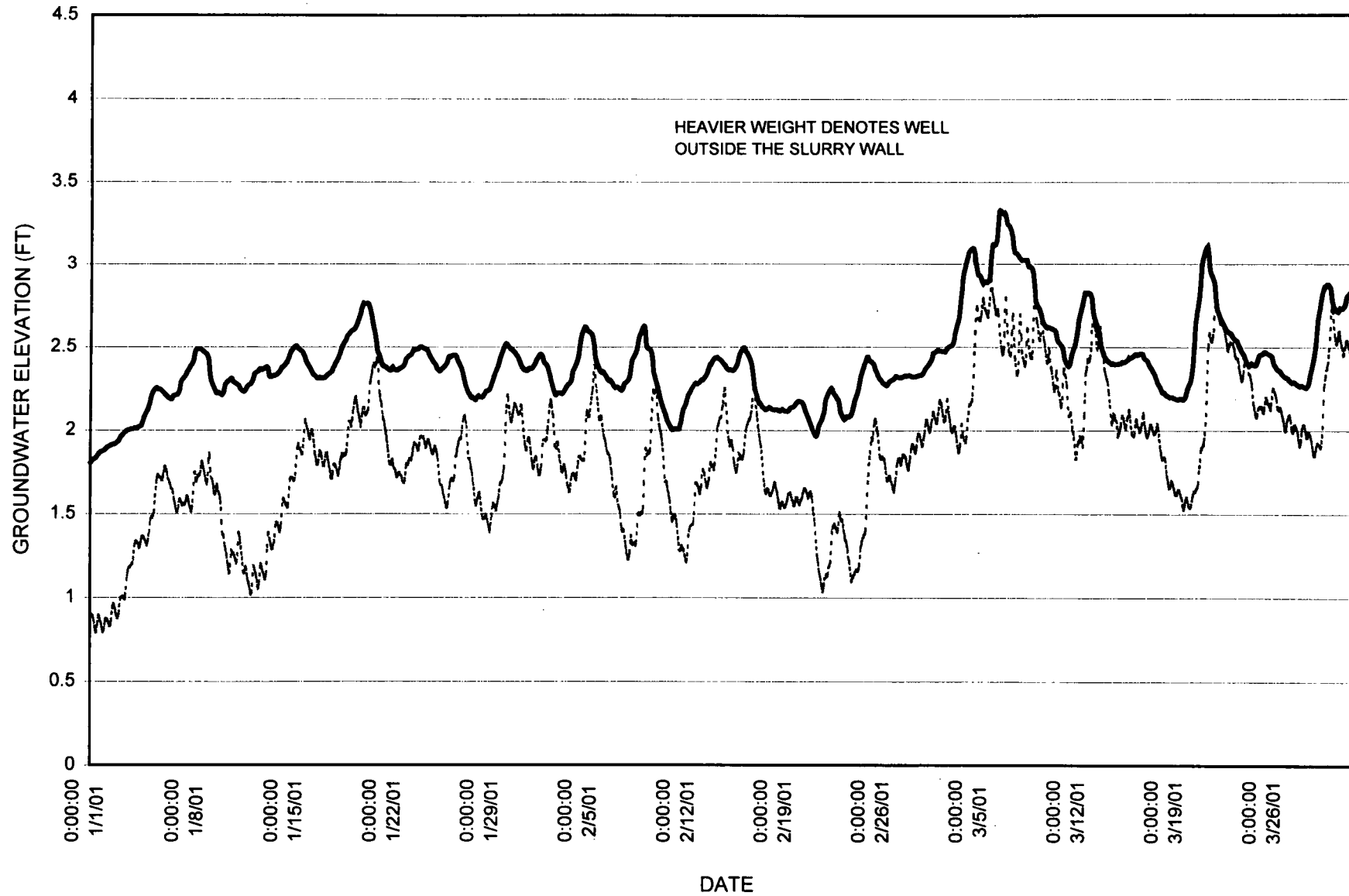


KIN-BUC LANDFILL GROUNDWATER HYDROGRAPH #7  
TRANSECT No.3  
SAND & GRAVEL UNITS



KIN-BUC LANDFILL GROUNDWATER HYDROGRAPH #8  
TRANSECT No.4  
SAND & GRAVEL UNIT

— 8S - - - - 7S

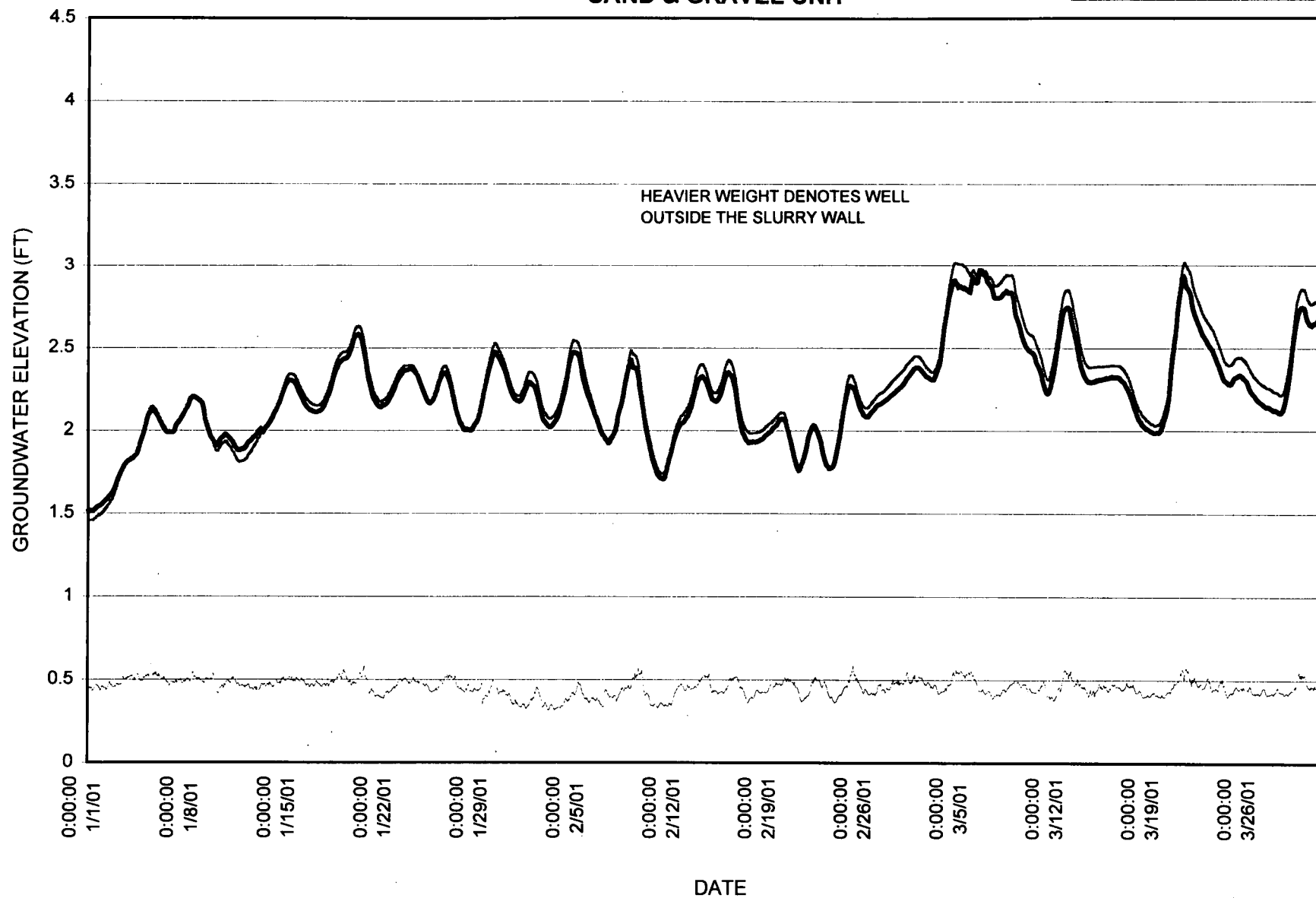


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TRANSECT No.4 (OSA)

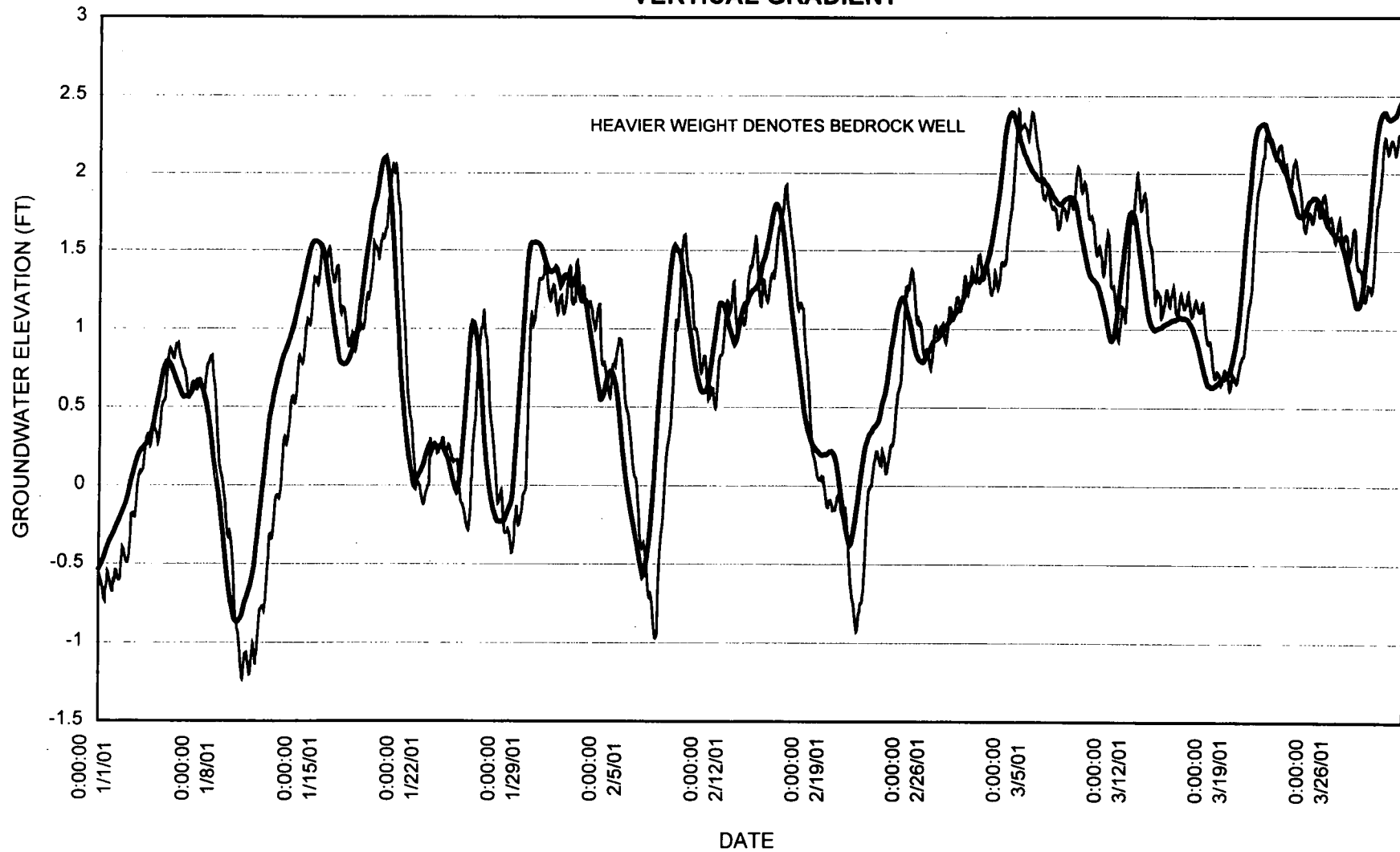
SAND & GRAVEL UNIT

— 13S    - - - - 15S  
— 15G



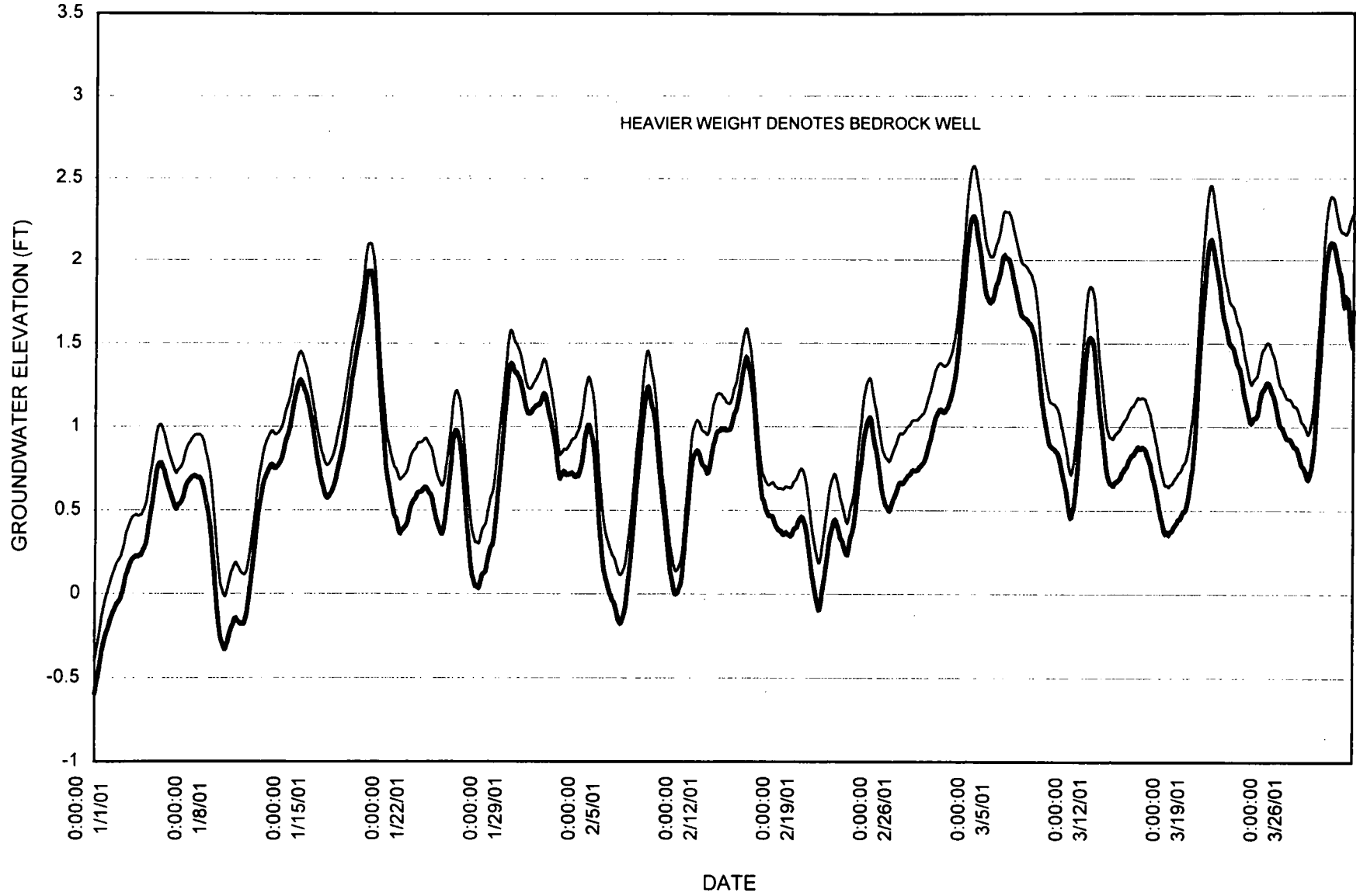
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TRANSECT No.2 - INSIDE  
VERTICAL GRADIENT

— 3RR — 3S



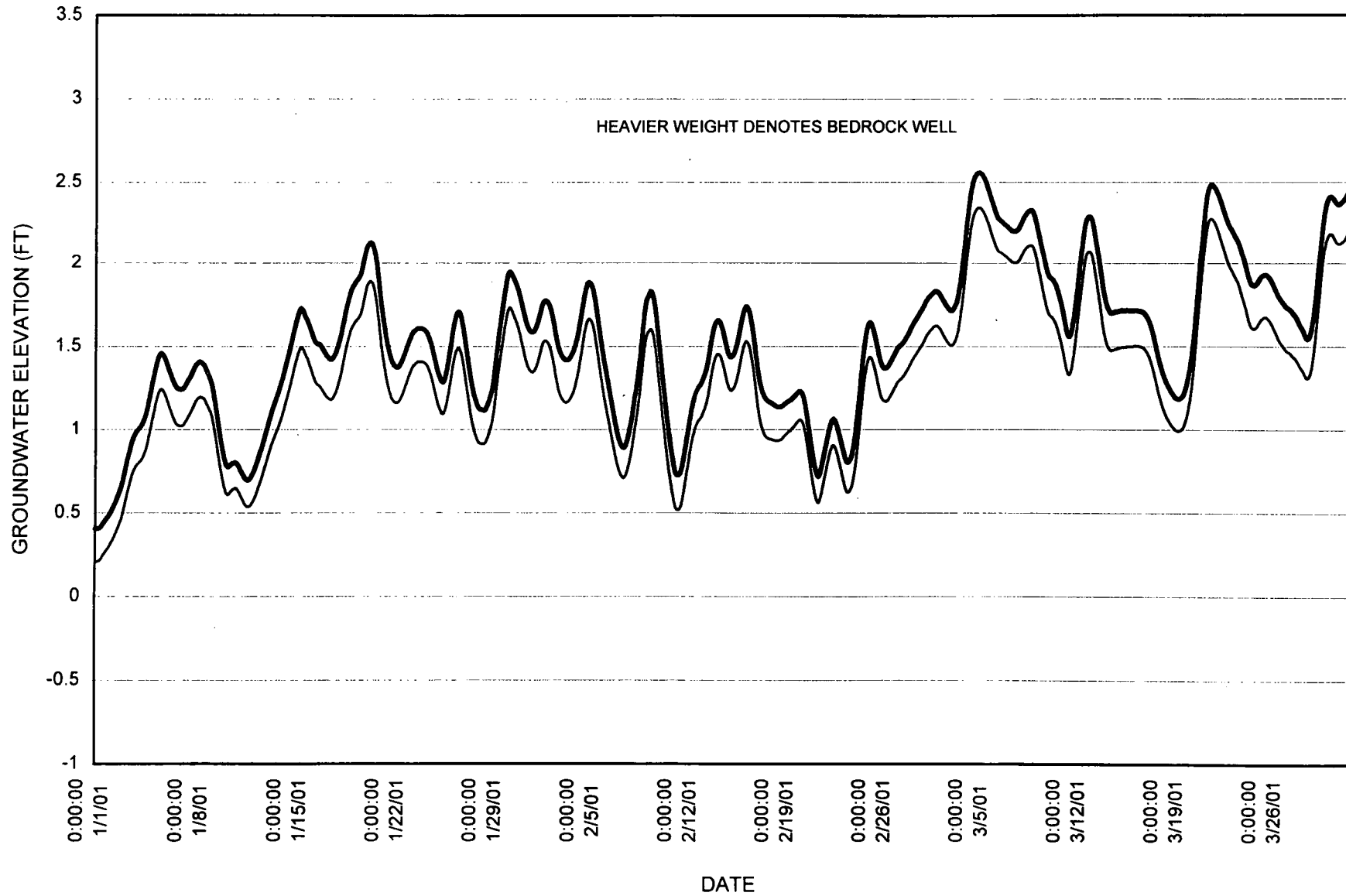
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TRANSECT No.2 - OUTSIDE  
VERTICAL GRADIENT

— 4R — 4S



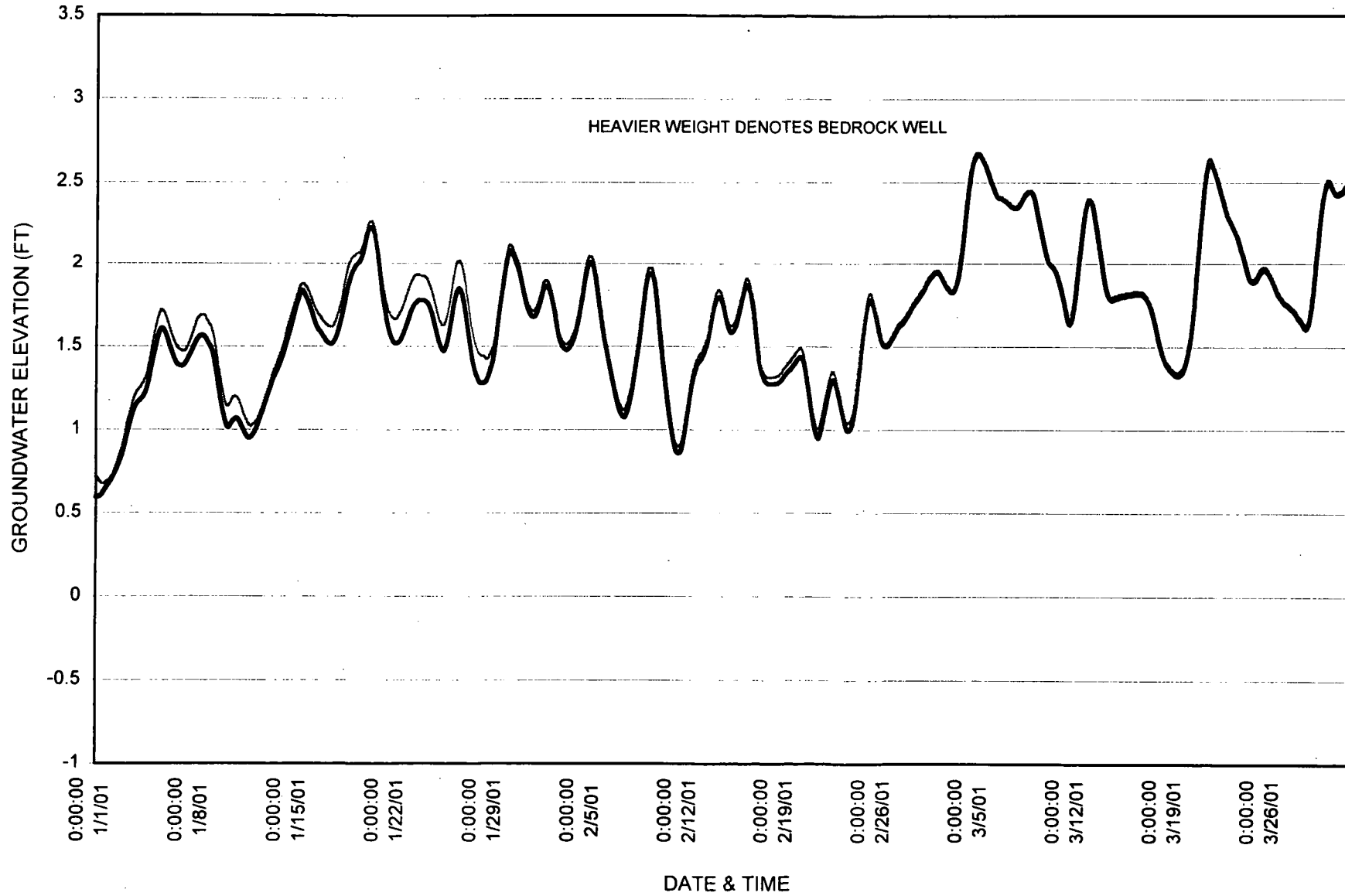
KIN-BUC LANDFILL GROUNDWATER HYDROGRAPH #12  
TRANSECT No.3 - INSIDE  
VERTICAL GRADIENT

— 5R — 5S

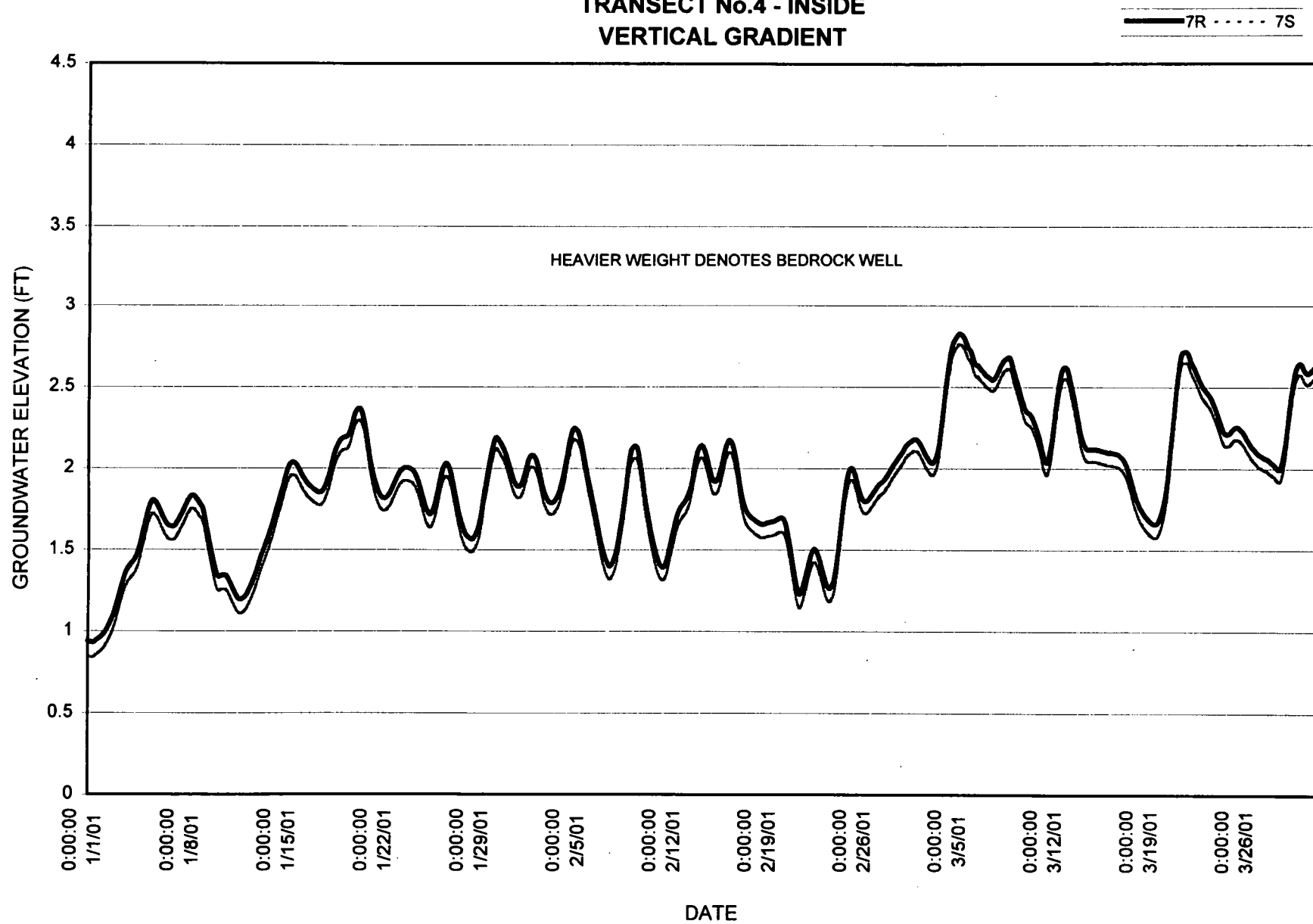


KIN-BUC LANDFILL GROUNDWATER HYDROGRAPH #13  
TRANSECT No.3 - OUTSIDE  
VERTICAL GRADIENT

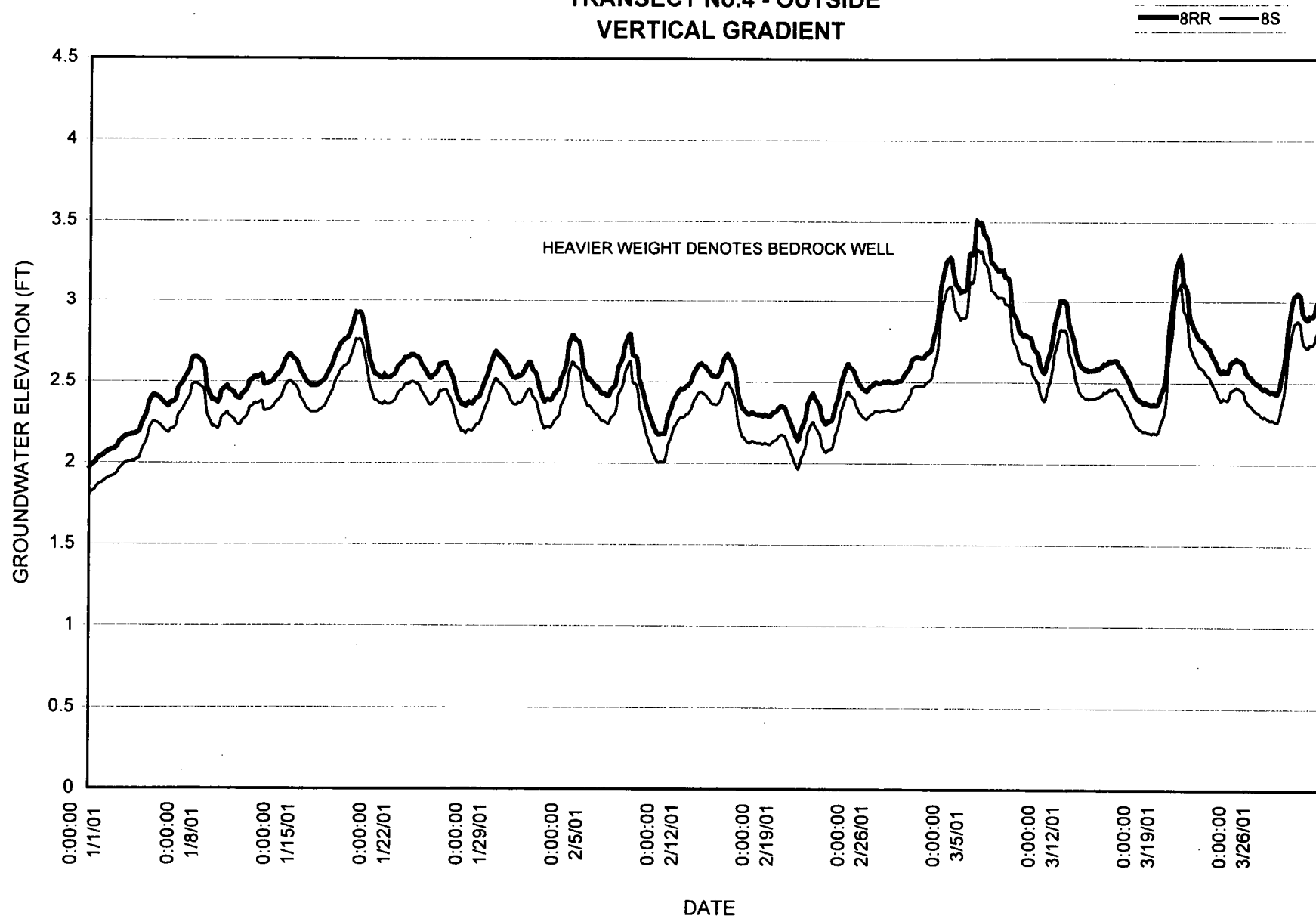
— 6R - - - - 6S



KIN-BUC LANDFILL GROUNDWATER HYDROGRAPH #14  
TRANSECT No.4 - INSIDE  
VERTICAL GRADIENT



KIN-BUC LANDFILL GROUNDWATER HYDROGRAPH #15  
TRANSECT No.4 - OUTSIDE  
VERTICAL GRADIENT



**APPENDIX B**  
**MONTHLY HYDRAULIC EVALUATIONS**



**IT Corporation**  
Crossroads Corporate Center  
One International Boulevard, Suite 700  
Mahwah, NJ 07495-0086  
Tel. 201.512.5700  
Fax. 201.512.5786  
A Member of The IT Group

February 19, 2001  
Project 796201

Carl Januszkiewicz  
Waste Management, Inc  
Kin-Buc Landfill Treatment Plant  
383 Meadow Road  
Edison, NJ 08817

Re: Hydraulic Monitoring for January 2001

Dear Mr. Januszkiewicz:

We would like to take this opportunity to provide you with an update of the hydraulic monitoring for the month of January 2001 at the Kin-Buc Landfill. This information is to be included in the quarterly report, which is to be submitted to the EPA in mid-May. As agreed with WMI, we will download and review the hydraulic monitoring data for the Kin-Buc site on a monthly basis.

Attachment 1 shows the hydrographs for each of the transect locations.

#### **Transect 1**

**Refuse (1G/2G)** - These monitoring wells indicate that intragradiant conditions are being maintained at this location.

#### **Transect 2**

**Refuse (3G/4G)** - Intragradiant conditions were not consistently maintained as evident by the higher heads in W-4G relative to W-3G. Intragradiant conditions were not maintained for an approximate 1-week period during the middle of January.

**Sand and Gravel (3S/4S)** - Intragradiant conditions were generally evident during most of the month.

#### **Transect 3**

**Refuse (5G/6G)** - The automatic data recorder for W-6G, outside of the wall, malfunctioned. The unit was removed and sent to the manufacturer for repairs.

**Sand and Gravel (5S/6S)** - Intragradiant conditions were maintained throughout the month.

Carl Januszkiewicz  
February 19, 2001  
Page 2

Project 796201

#### **Transect 4**

**Refuse Oil Seeps Area (13G/15G)** - Intragradient conditions were maintained throughout the month

**Sand and Gravel Oil Seeps Area (13S/15S)** - Intragradient conditions were observed during the month but were not consistently maintained. It is emphasized that in many instances, head differences between W-13S and W-15S were very minor (less than a tenth of a foot) and may not be significant in any event.

**Sand and Gravel (7S/8S)** - Intragradient conditions were maintained throughout the month.

#### **Transect 5**

**Refuse (9G/10G)** - Intragradient conditions were maintained throughout the month.

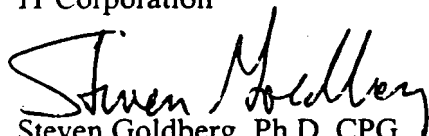
#### **Conclusions**


Intragradient conditions are generally being maintained at most locations with the exception of an approximate 1-week period in the refuse units at Transect 2.

We trust you find this information useful. If you have any questions, please do not hesitate to contact us.

Sincerely,

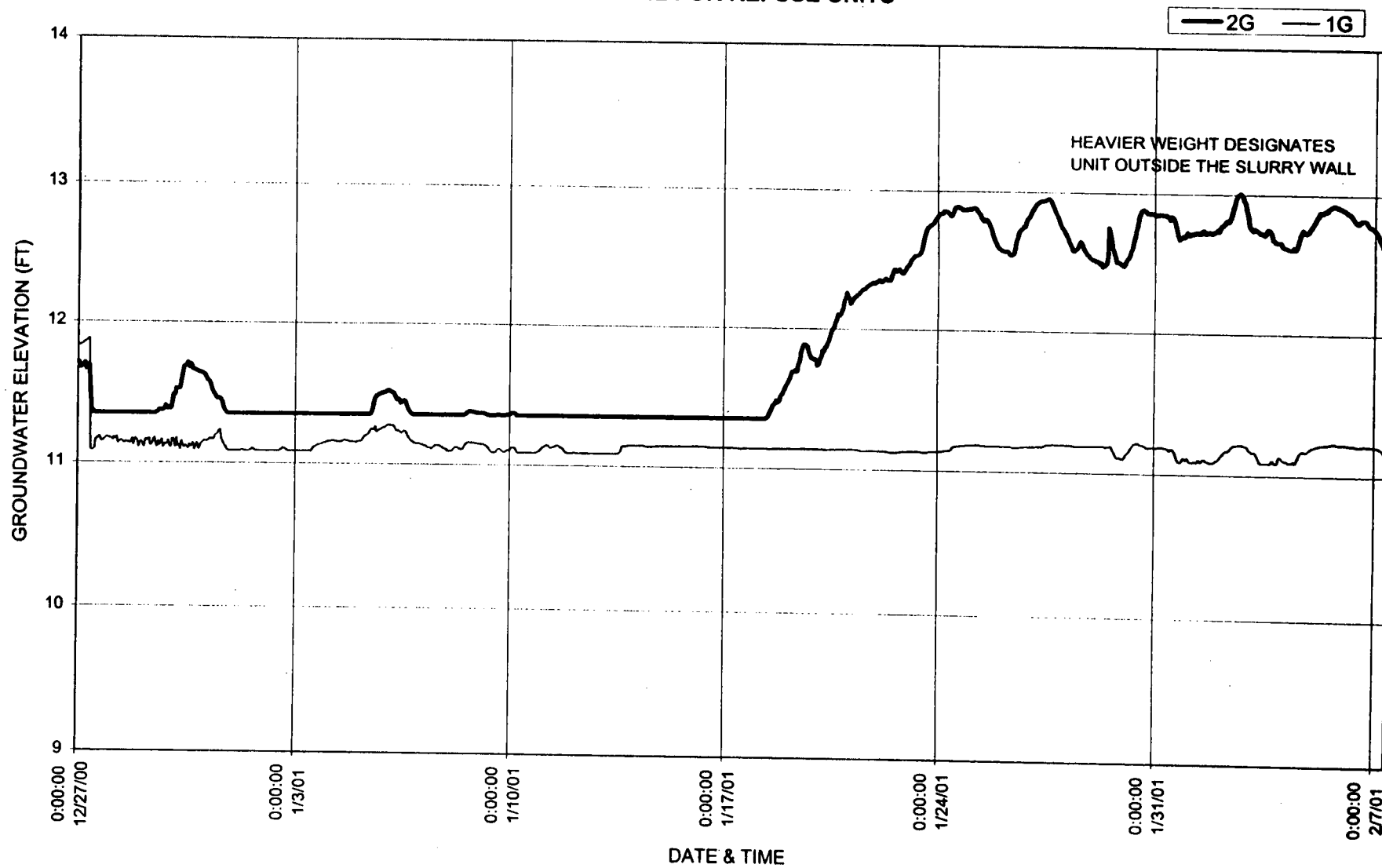
IT Corporation

  
Steven Goldberg, Ph.D, CPG  
Senior Hydrogeologist

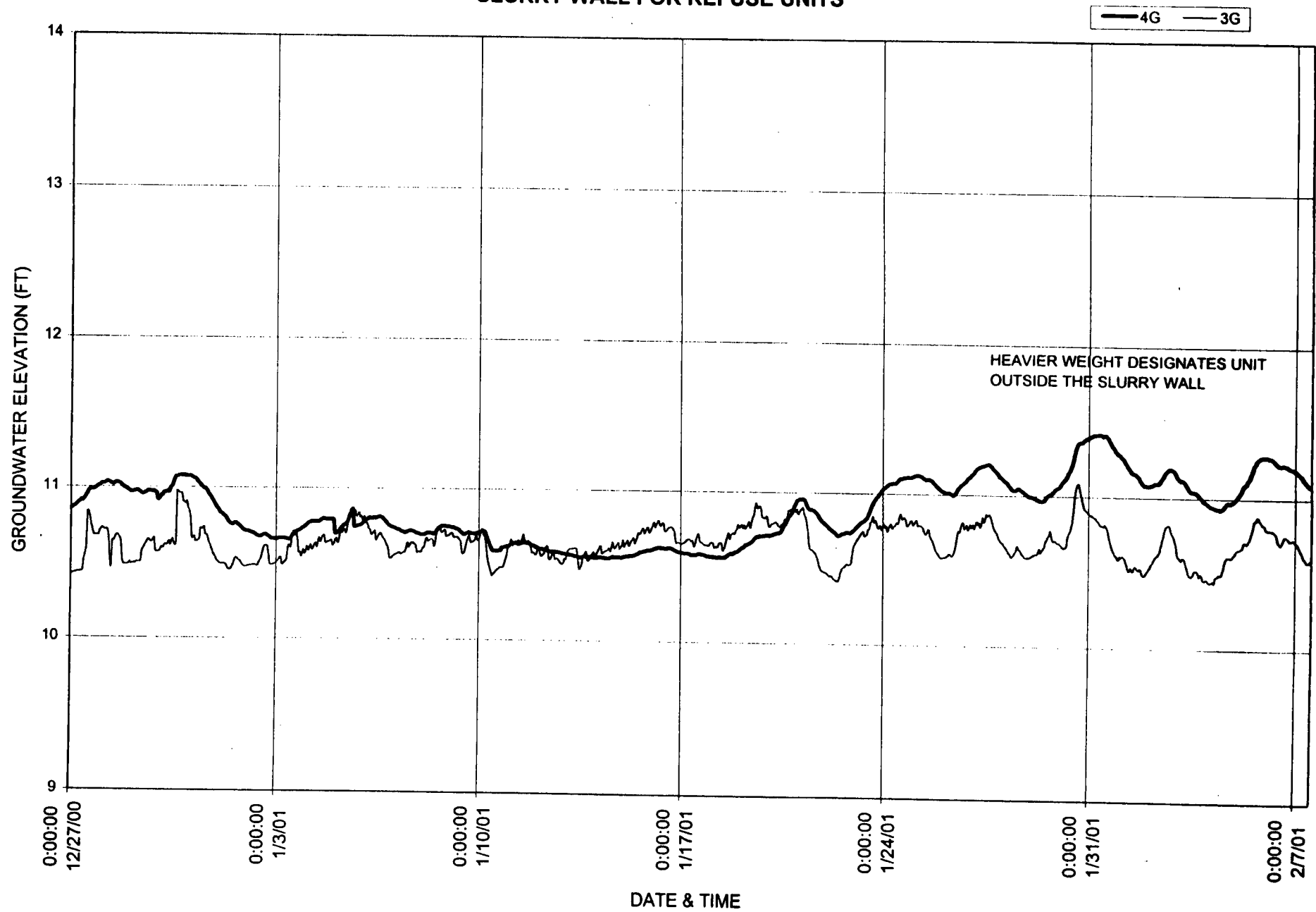
  
Thomas Connors, P.E.  
Project Manager

Attachments

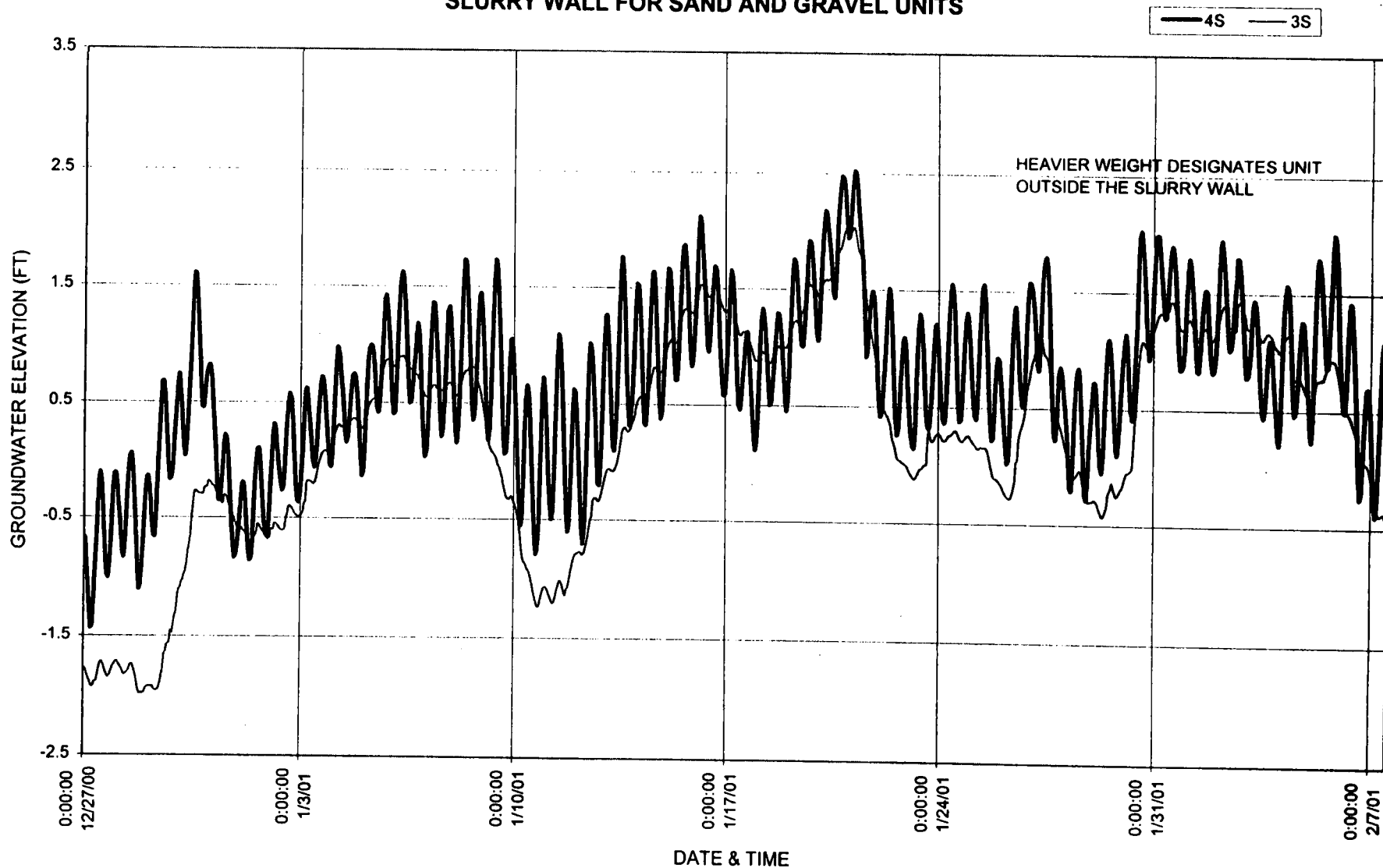
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.1 ACROSS  
SLURRY WALL FOR REFUSE UNITS



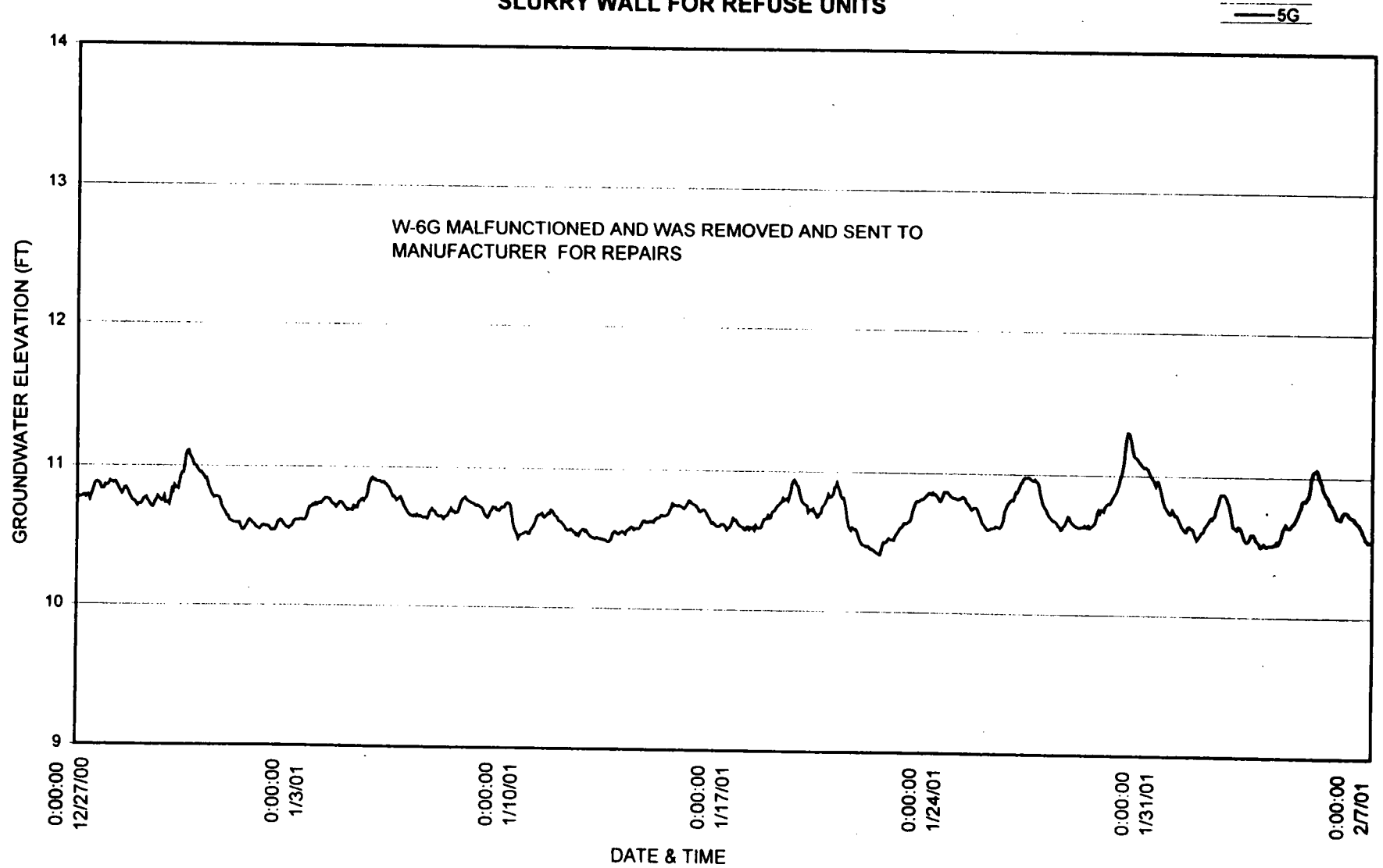
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No. 2 ACROSS  
SLURRY WALL FOR REFUSE UNITS



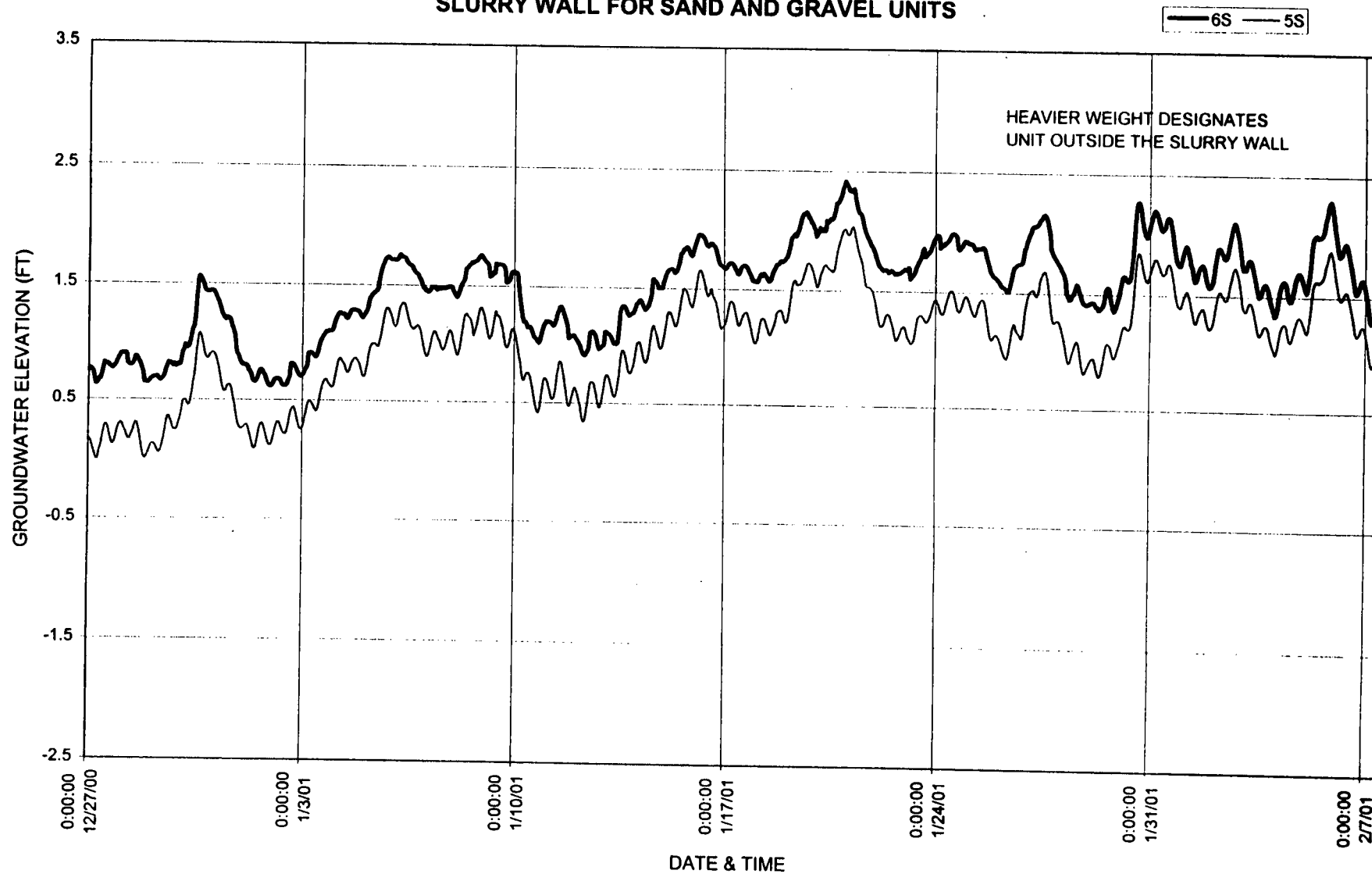
# KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.2 ACROSS SLURRY WALL FOR SAND AND GRAVEL UNITS



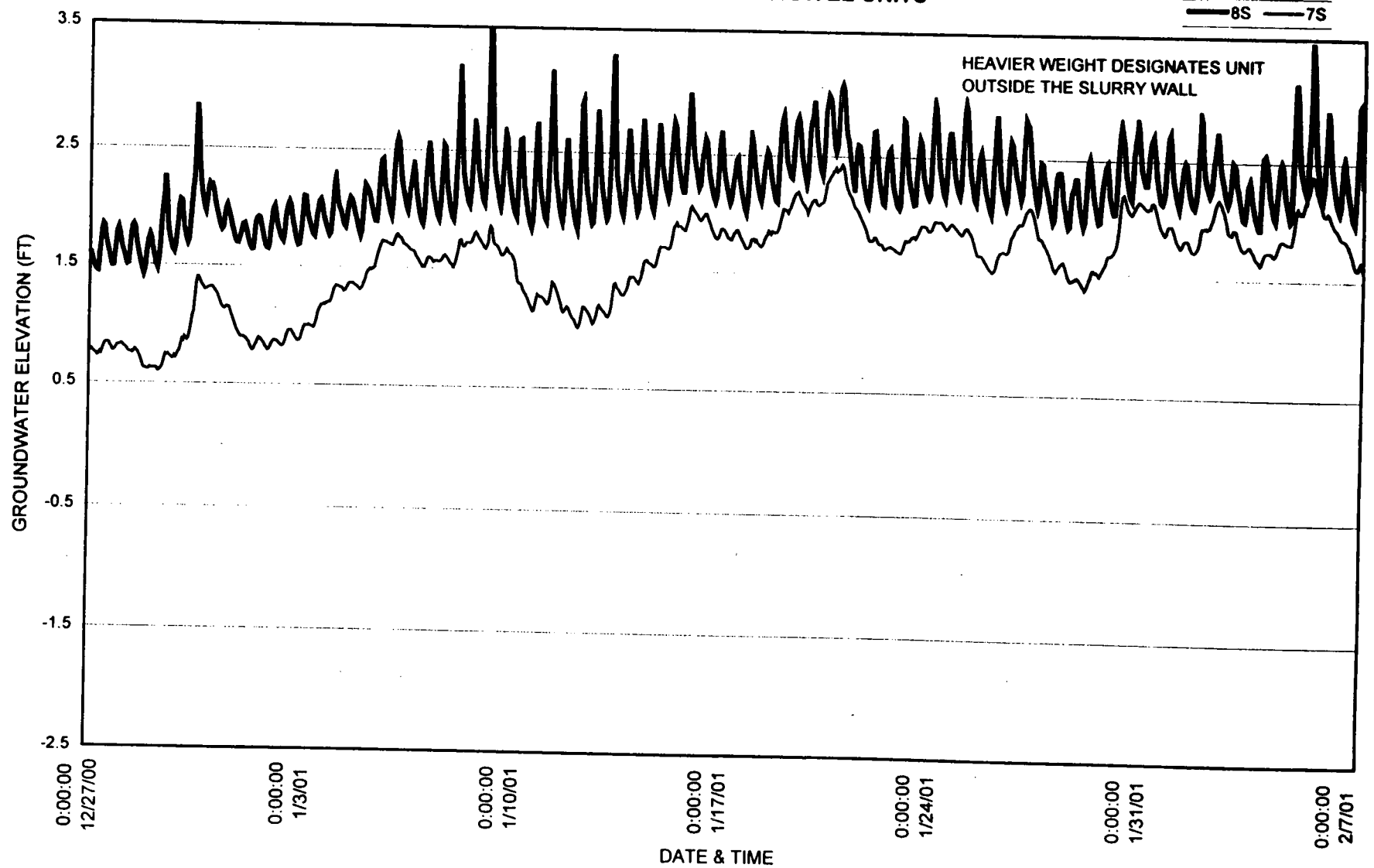
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.3 ACROSS  
SLURRY WALL FOR REFUSE UNITS



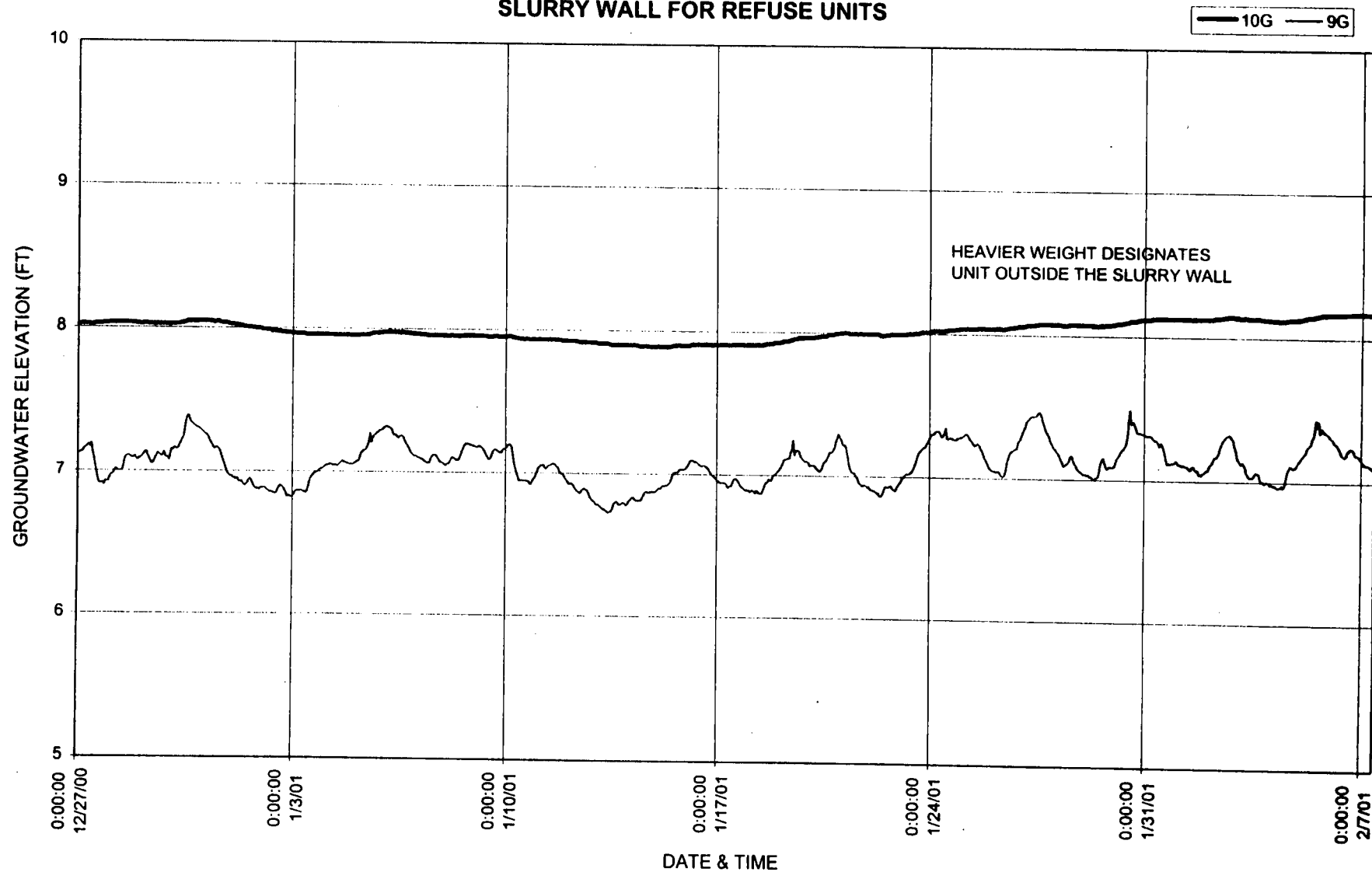
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.3 ACROSS  
SLURRY WALL FOR SAND AND GRAVEL UNITS



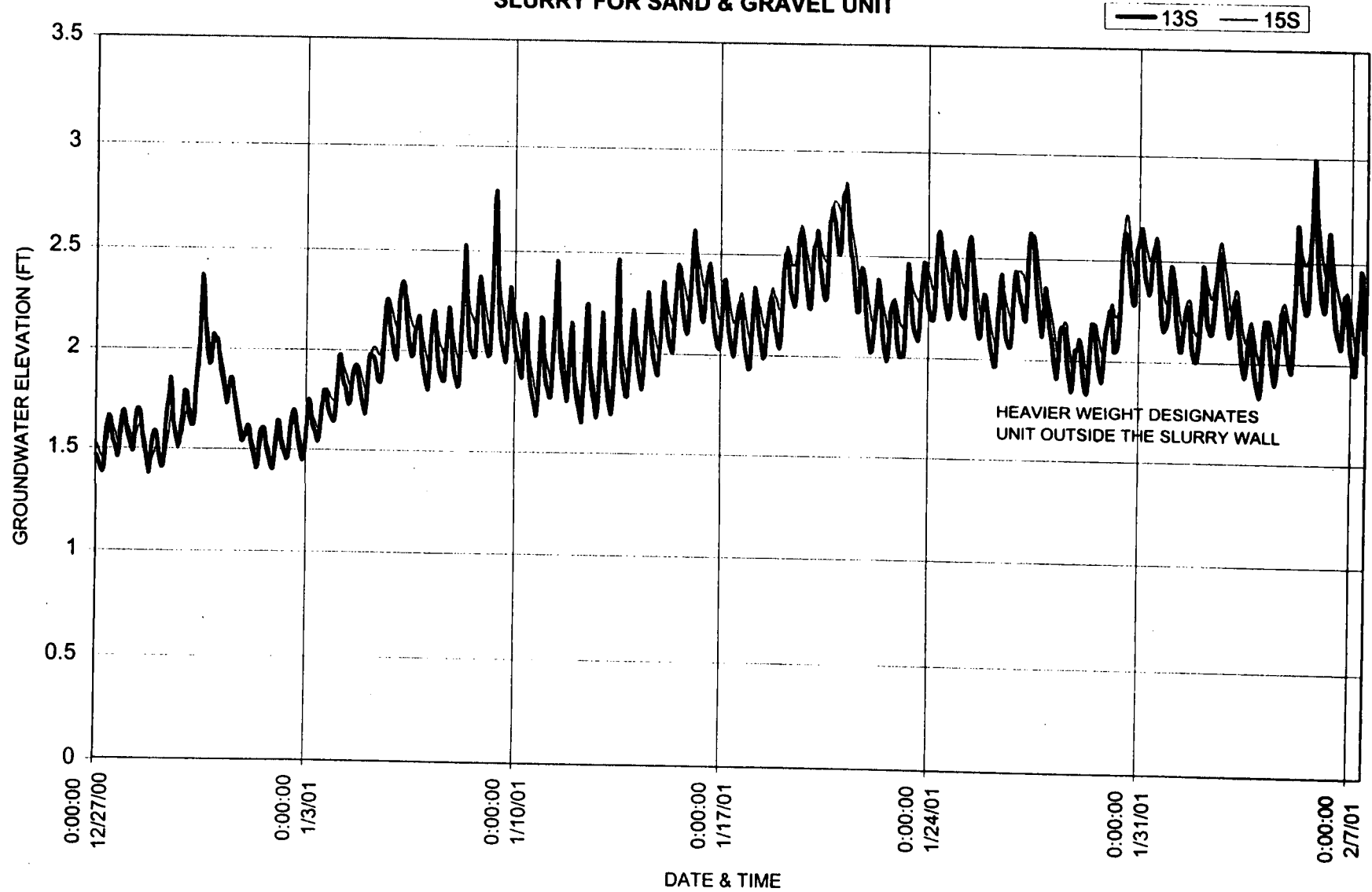
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 ACROSS  
SLURRY WALL FOR SAND & GRAVEL UNITS



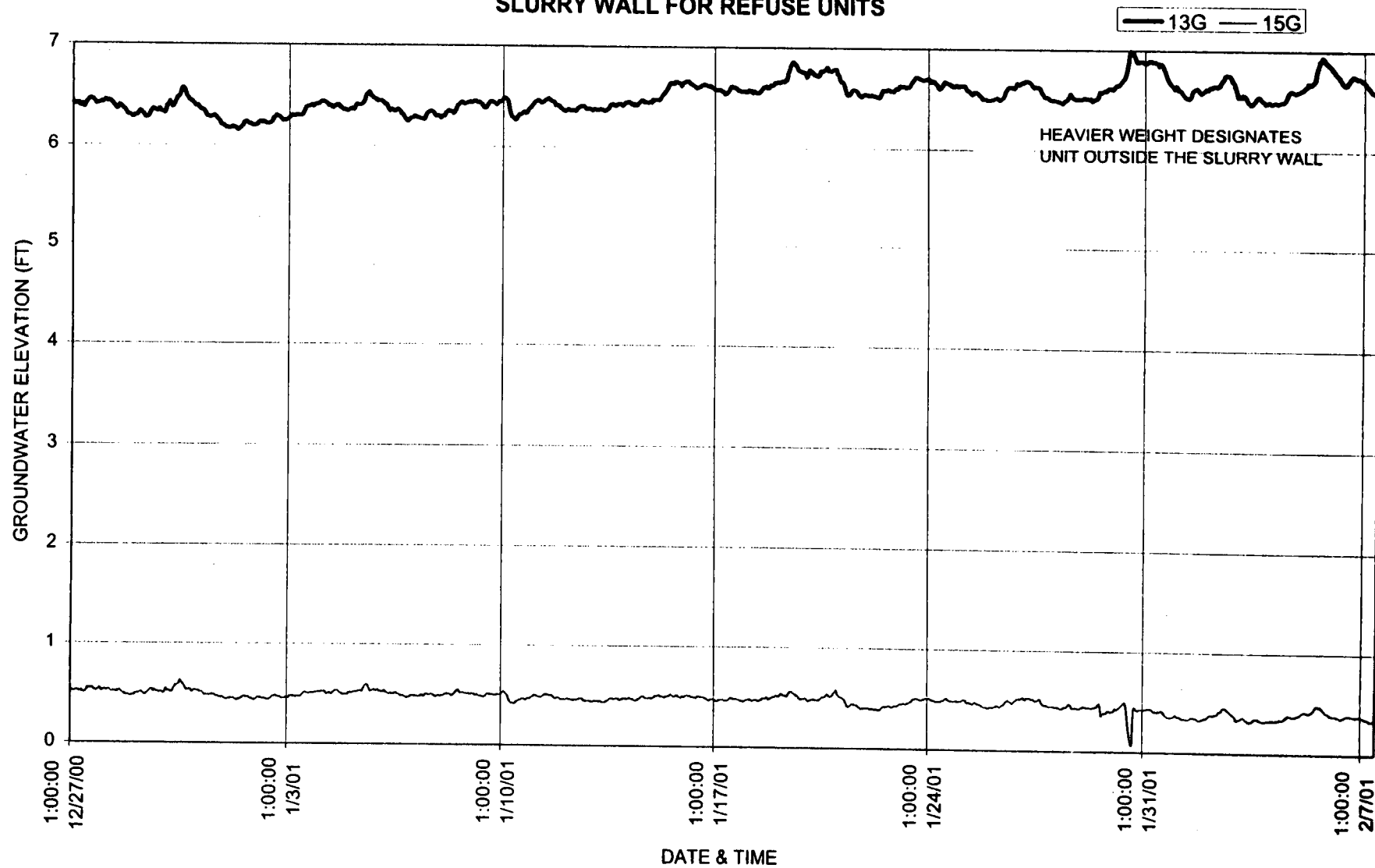
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.5 ACROSS  
SLURRY WALL FOR REFUSE UNITS



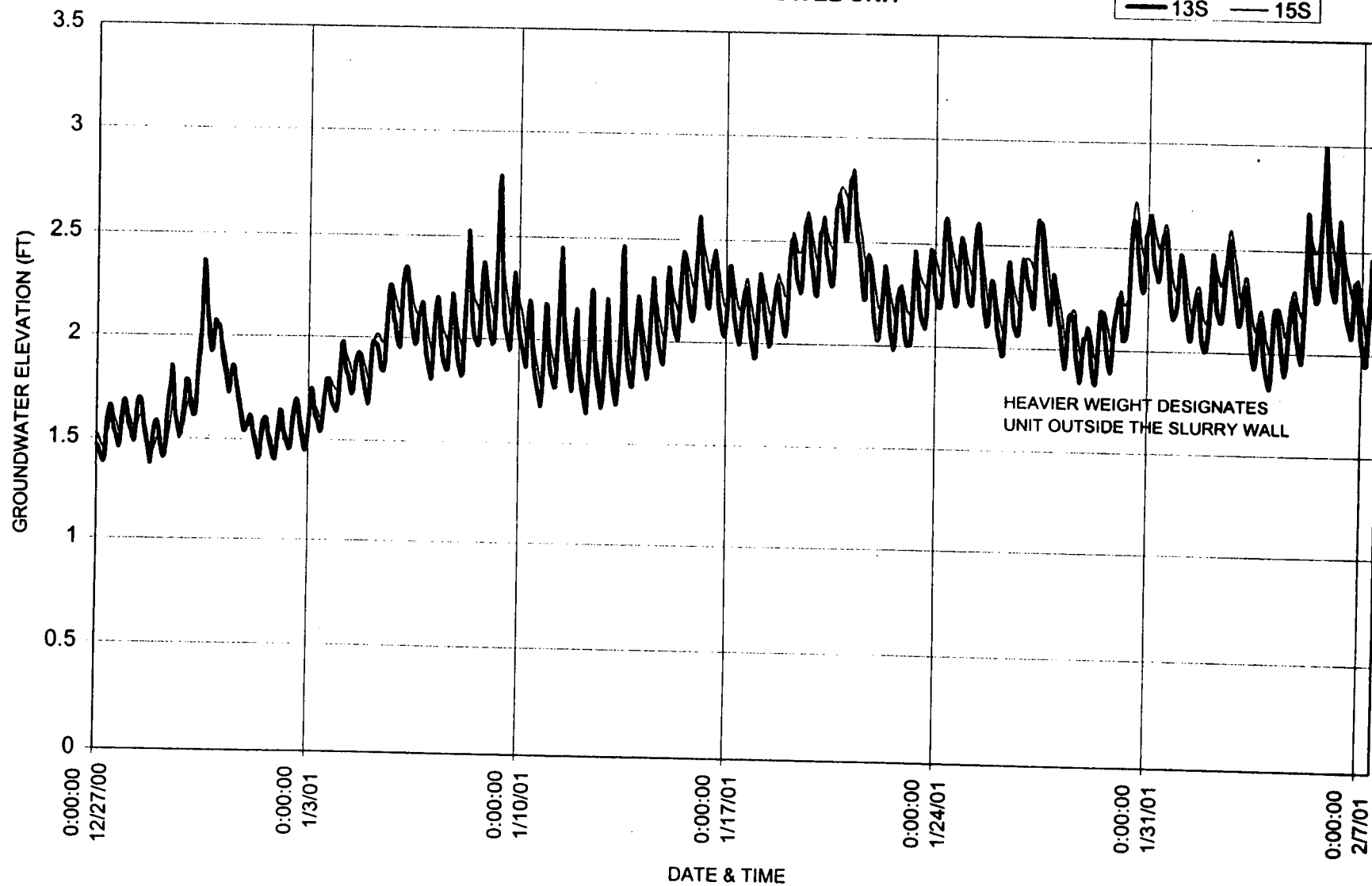
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 (OSA) ACROSS  
SLURRY FOR SAND & GRAVEL UNIT



KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 (OSA) ACROSS  
SLURRY WALL FOR REFUSE UNITS



KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 (OSA) ACROSS  
SLURRY FOR SAND & GRAVEL UNIT





**IT Corporation**  
Crossroads Corporate Center  
One International Boulevard, Suite 700  
Mahwah, NJ 07495-0086  
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A Member of The IT Group

March 20, 2001  
Project 796201

Carl Januszkiewicz  
Waste Management, Inc.  
Kin-Buc Landfill Treatment Plant  
383 Meadow Road  
Edison, NJ 08817

Re: Hydraulic Monitoring for February 2001

Dear Mr. Januszkiewicz:

We would like to take this opportunity to provide you with an update of the hydraulic monitoring for the month of February 2001 at the Kin-Buc Landfill. This information is to be included in the quarterly report, which is to be submitted to the EPA in mid-May. As agreed with WMI, we will download and review the hydraulic monitoring data for the Kin-Buc site on a monthly basis.

Attachment 1 shows the hydrographs for each of the transect locations.

#### **Transect 1**

**Refuse (1G/2G)** - These monitoring wells indicate that intragradient conditions are being maintained at this location.

#### **Transect 2**

**Refuse (3G/4G)** - These monitoring wells indicate that intragradient conditions are being maintained at this location.

**Sand and Gravel (3S/4S)** - Intragradient conditions were generally evident during most of the month.

#### **Transect 3**

**Refuse (5G/6G)** - The automatic data recorder for W-6G, outside the wall malfunctioned. The unit was removed, sent to the manufacturer for repairs, and was replaced. Downloading of water level data is scheduled for April.

**Sand and Gravel (5S/6S)** - Intragradient conditions were maintained throughout the month.

#### **Transect 4**

**Refuse Oil Seeps Area (13G/15G)** - Intragradient conditions were maintained throughout the month.

Carl Januszkiewicz  
March 20, 2001  
Page 2

Project 796201

**Sand and Gravel Oil Seeps Area (13S/15S)** - Intragradiant conditions were observed during the month but were not consistently maintained. It is emphasized that in many instances, head differences between W-13S and W-15S were very minor (less than a tenth of a foot) and may not be significant in any event.

**Sand and Gravel (7S/8S)** - Intragradiant conditions were maintained throughout the month.

#### **Transect 5**

**Refuse (9G/10G)** - Intragradiant conditions were maintained throughout the month.

#### **Groundwater and Leachate Collection**

Based on data provided by U.S. Filter, the following volumes of groundwater and leachate were extracted from the sand and gravel wells and leachate collection system:

S&G #1	S&G #2	S&G #3	Leachate
106,339 gal.	137,858 gal.	100,316 gal.	18,594 gal.
3,798 gpd	4,923 gpd	3,582 gpd	664 gpd

The average groundwater extraction rate of 12,303 gpd is below the recommended extraction rate of 15,000 gpd. The leachate extraction rate of 664 gpd is below the recommended rate of 1,500 gpd.

#### **CONCLUSIONS/RECOMMENDATIONS**

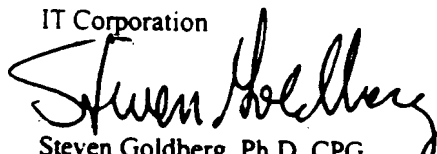
Intragradiant conditions are generally being maintained at the transect locations.


Groundwater extraction rates should be adjusted to meet the recommended rates of 10,000 gpd and 5,000 gpd from S&G Wells 2 and 3, respectively. Leachate collection rates should be increased to 1,500 gpd.

We trust you find this information useful. If you have any questions, please do not hesitate to contact us.

Sincerely,

IT Corporation

  
Steven Goldberg, Ph.D., CPG  
Senior Hydrogeologist

  
Thomas Connors, P.E.  
Project Manager

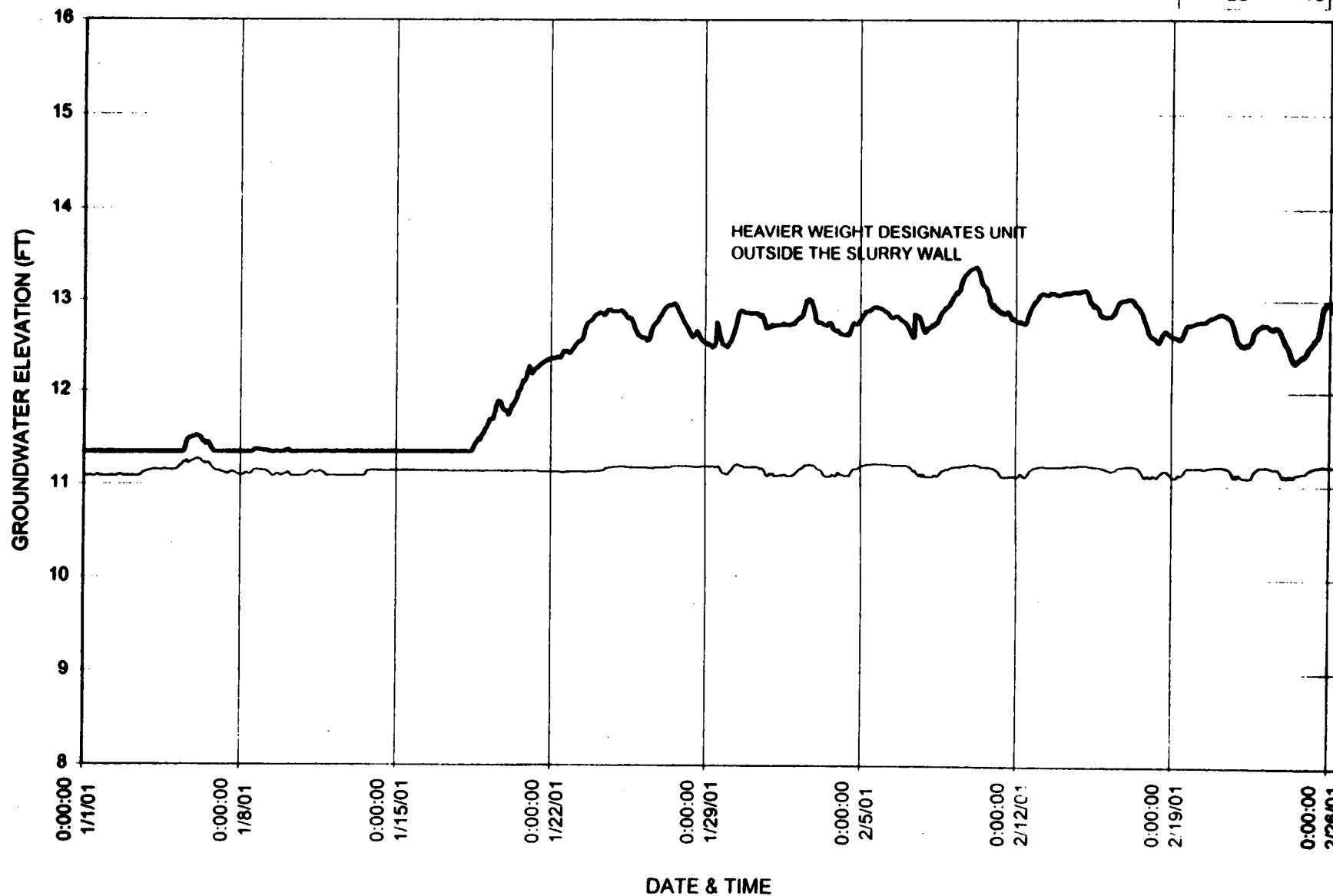
Attachments

**ATTACHMENT 1**

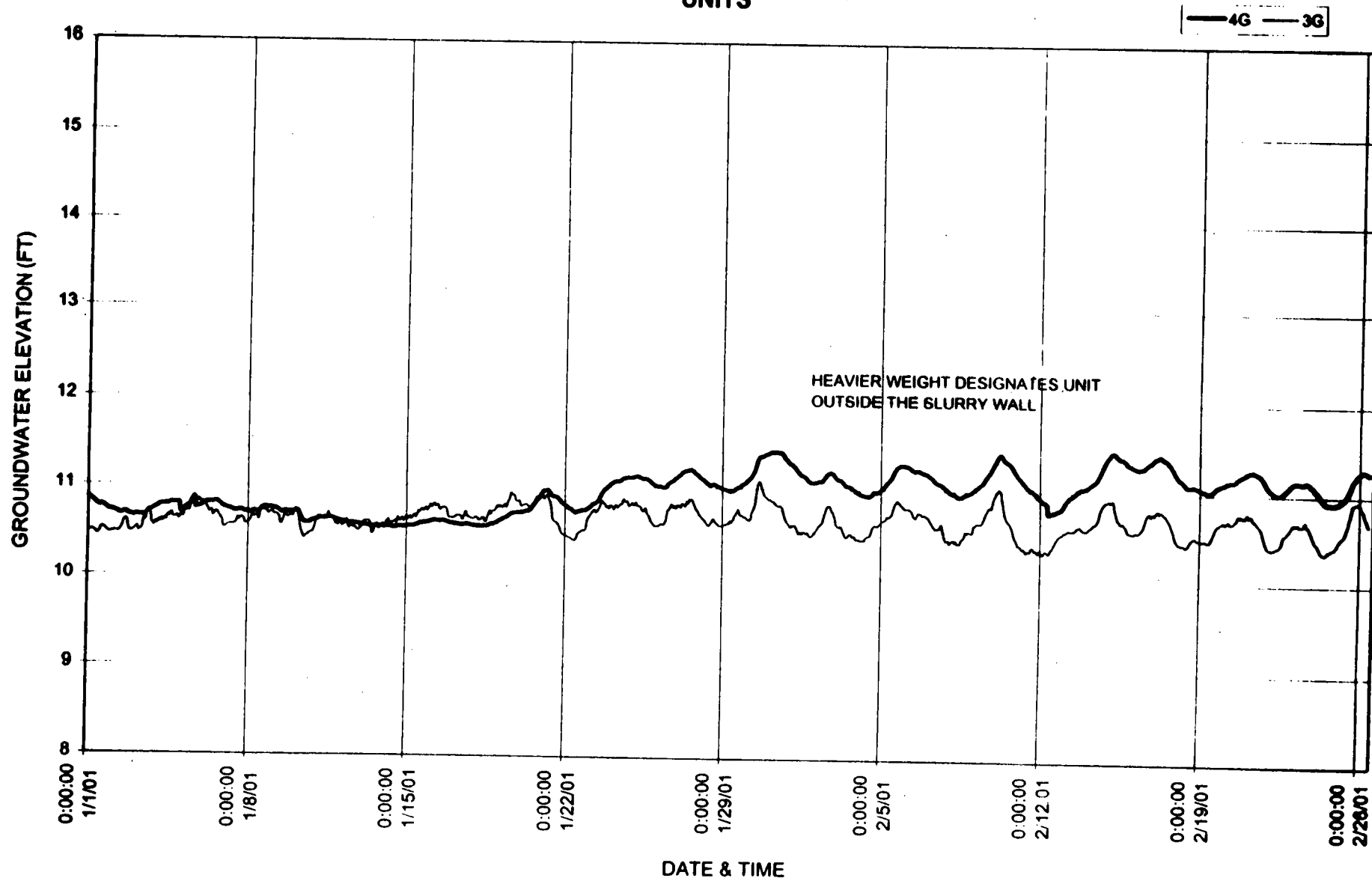
# KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.1 REFUSE

UNITS

— 2G — 1G

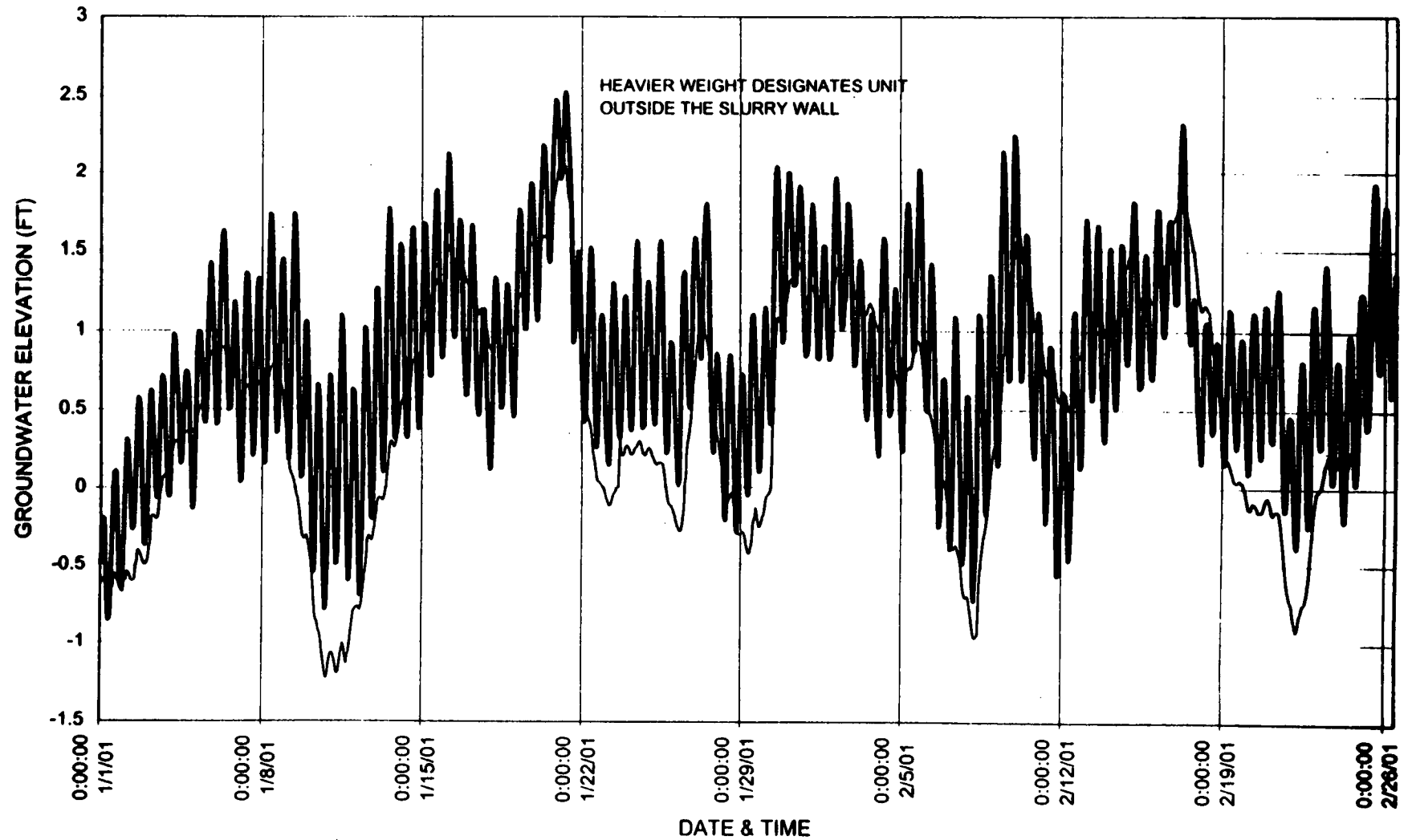


KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.2 REFUSE  
UNITS



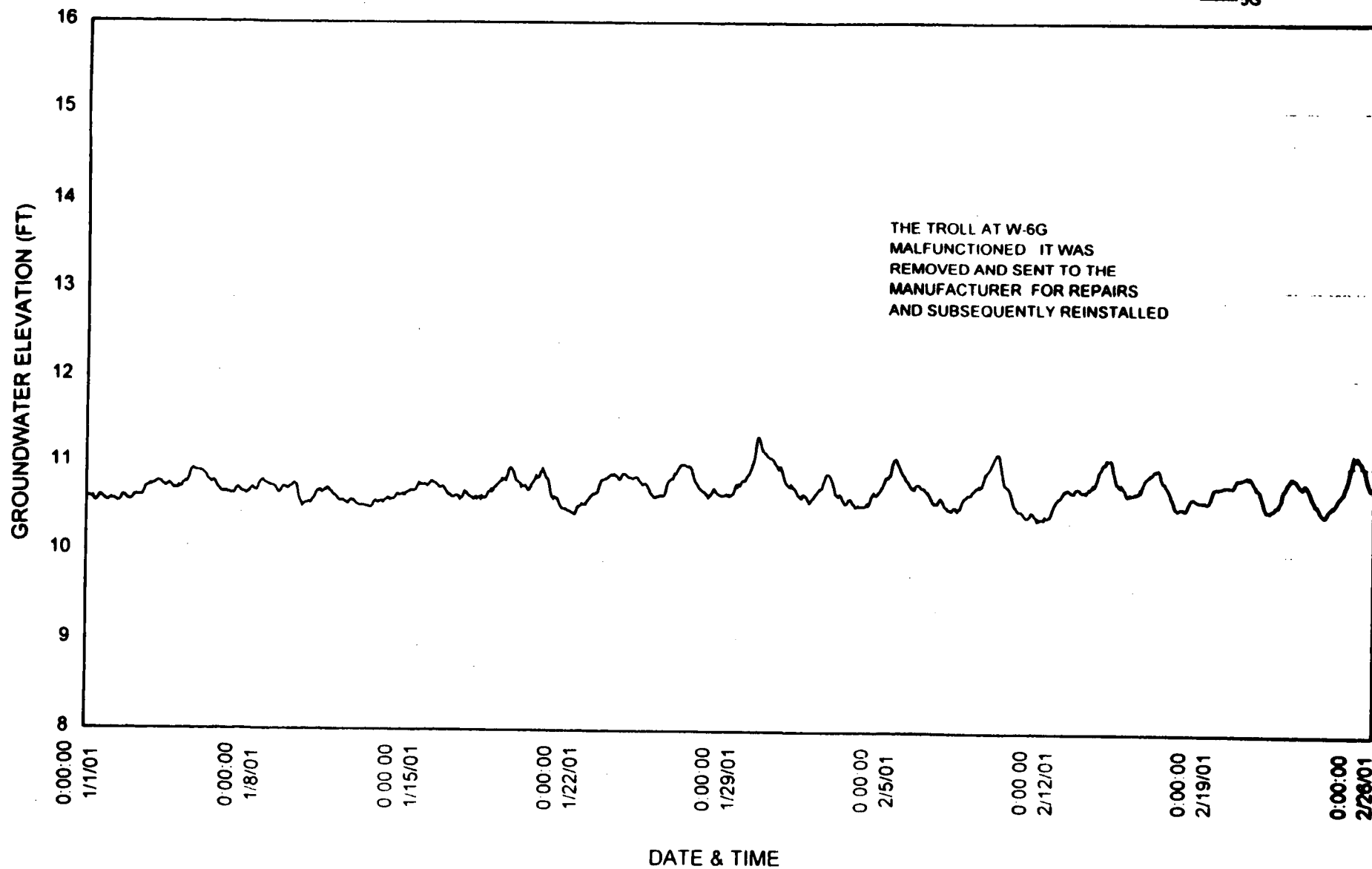
**KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.2 SAND  
& GRAVEL UNITS**

|—4S —3S|

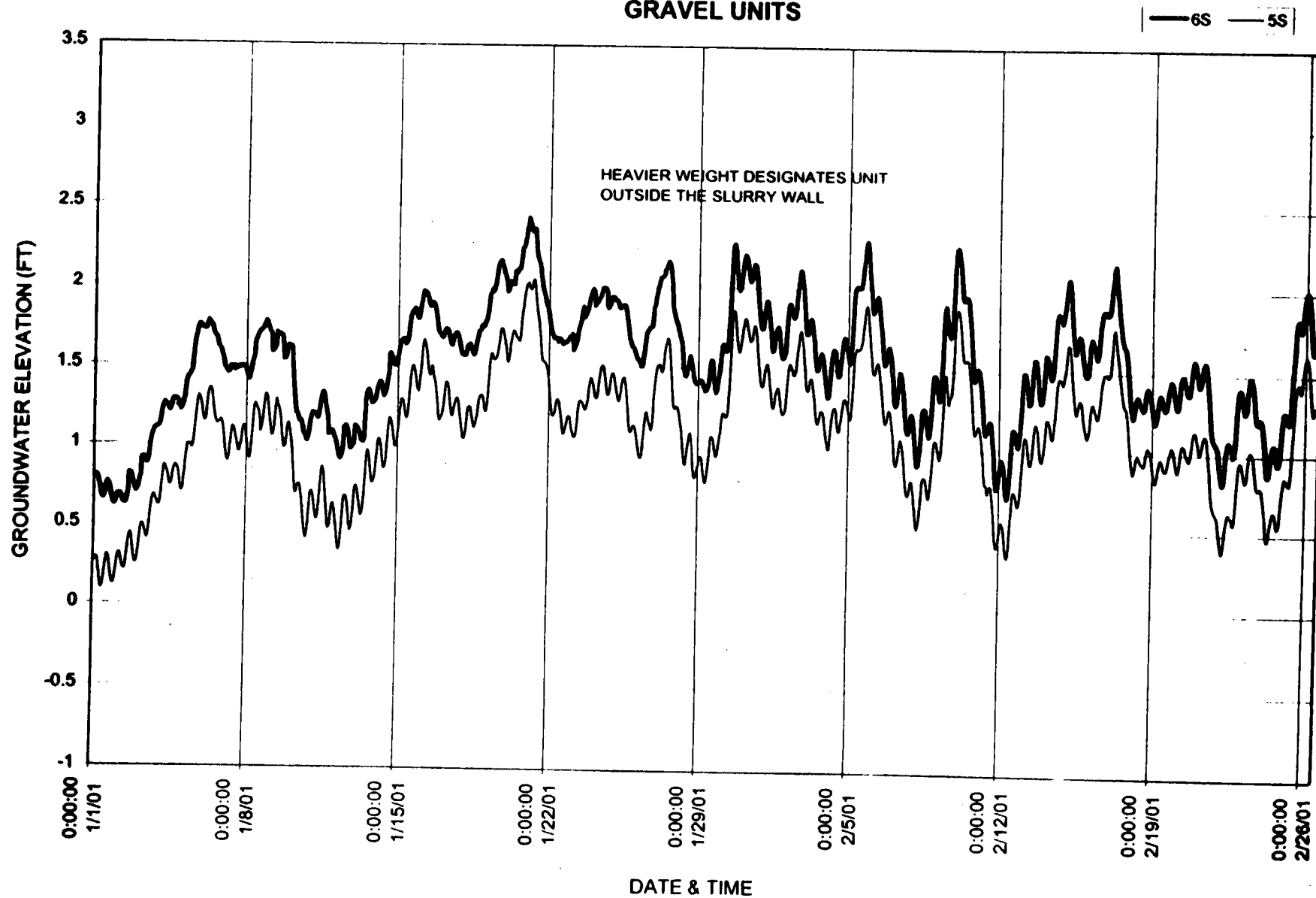


KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.3 REFUSE  
UNITS

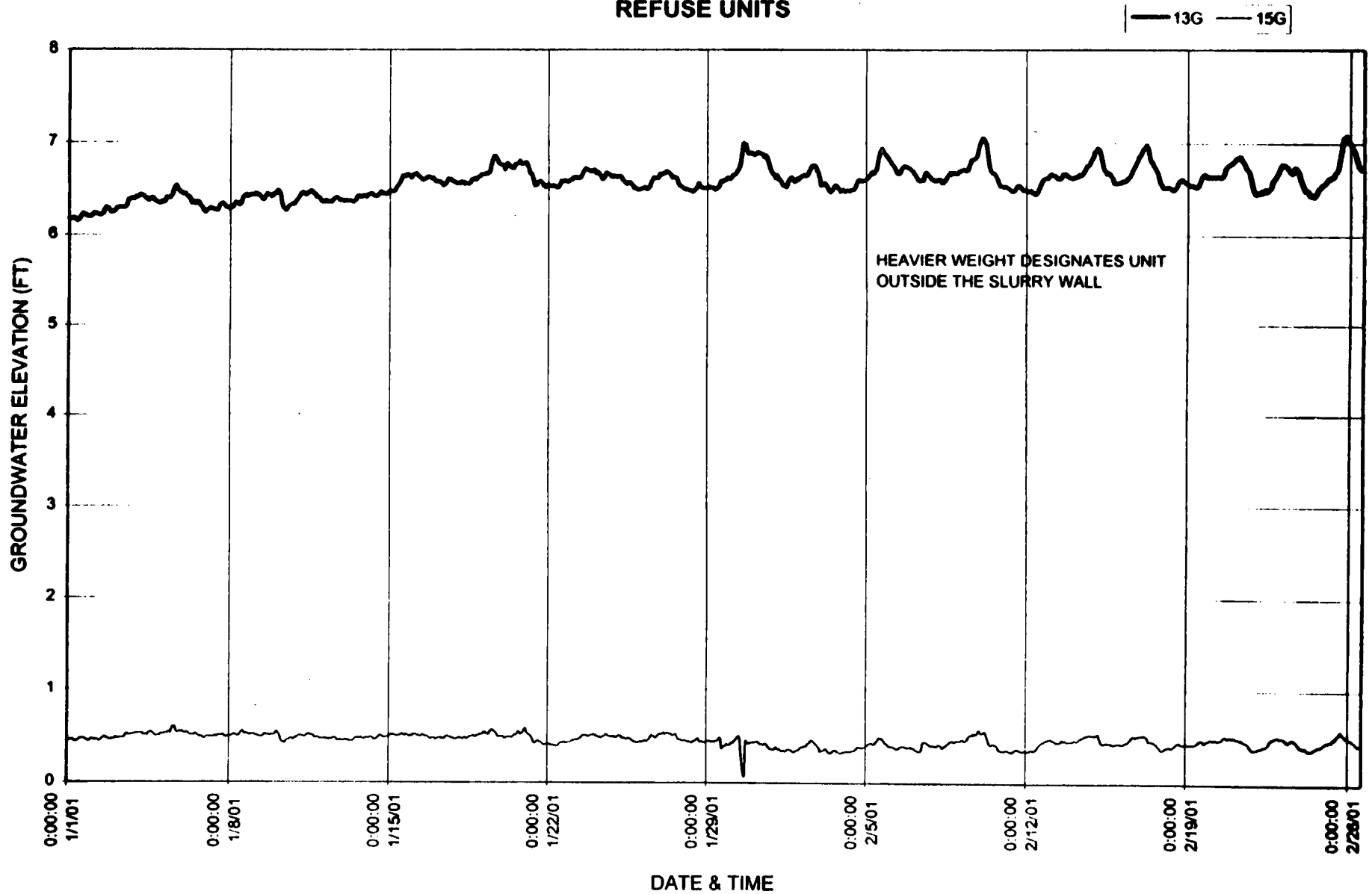
—5G



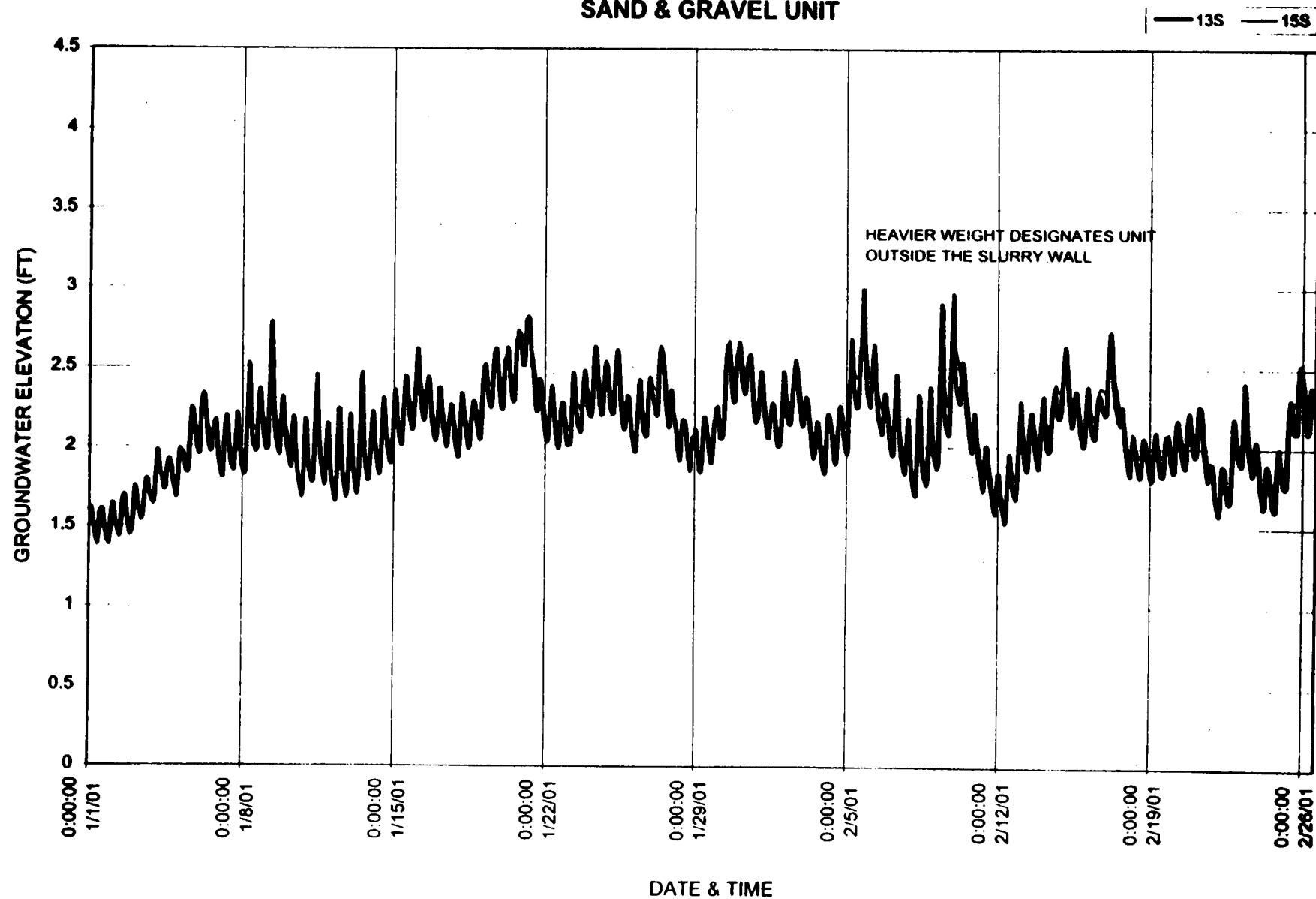
# KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.3 SAND & GRAVEL UNITS



KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 (OSA)  
REFUSE UNITS

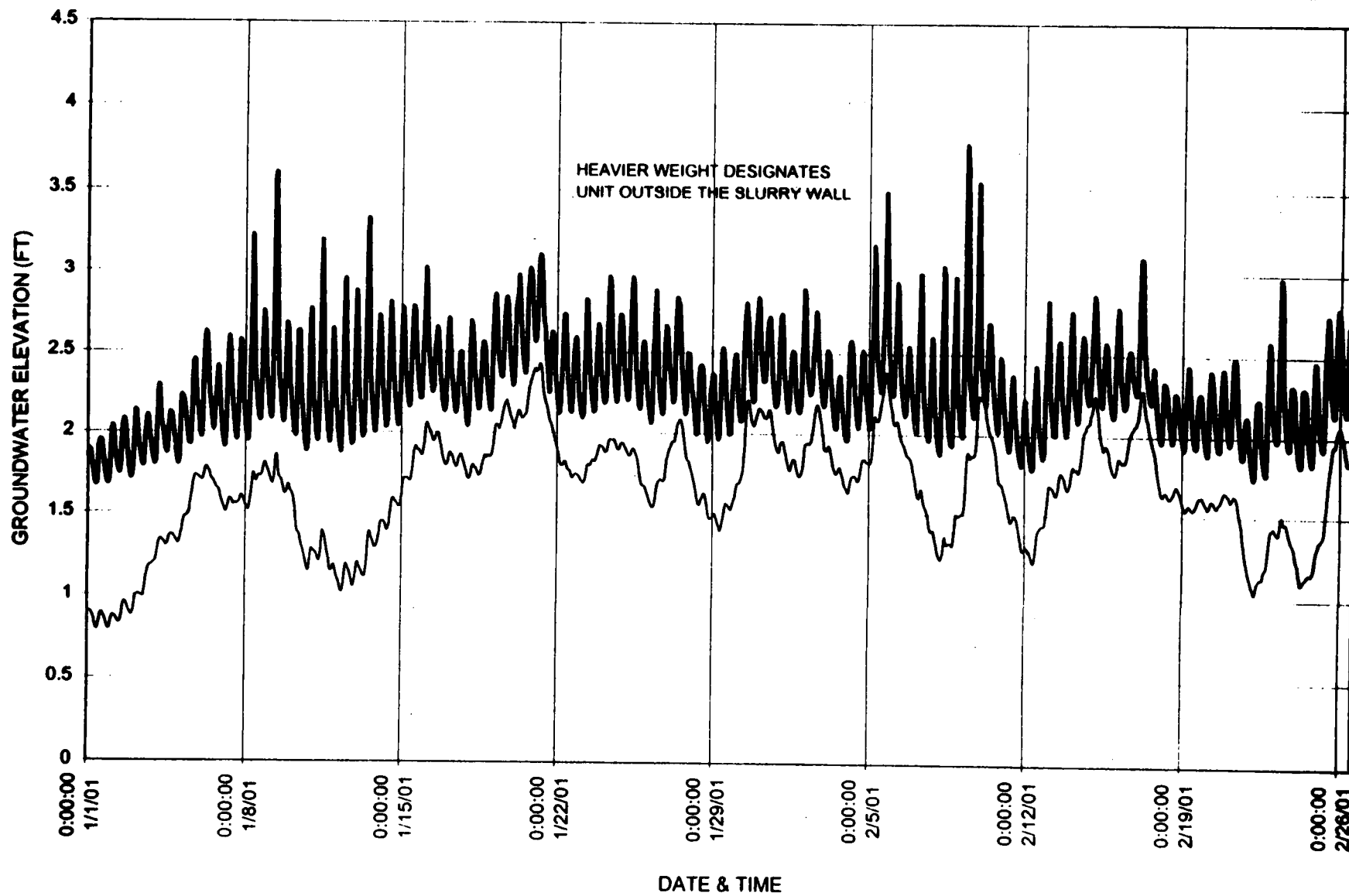


KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 (OSA)  
SAND & GRAVEL UNIT

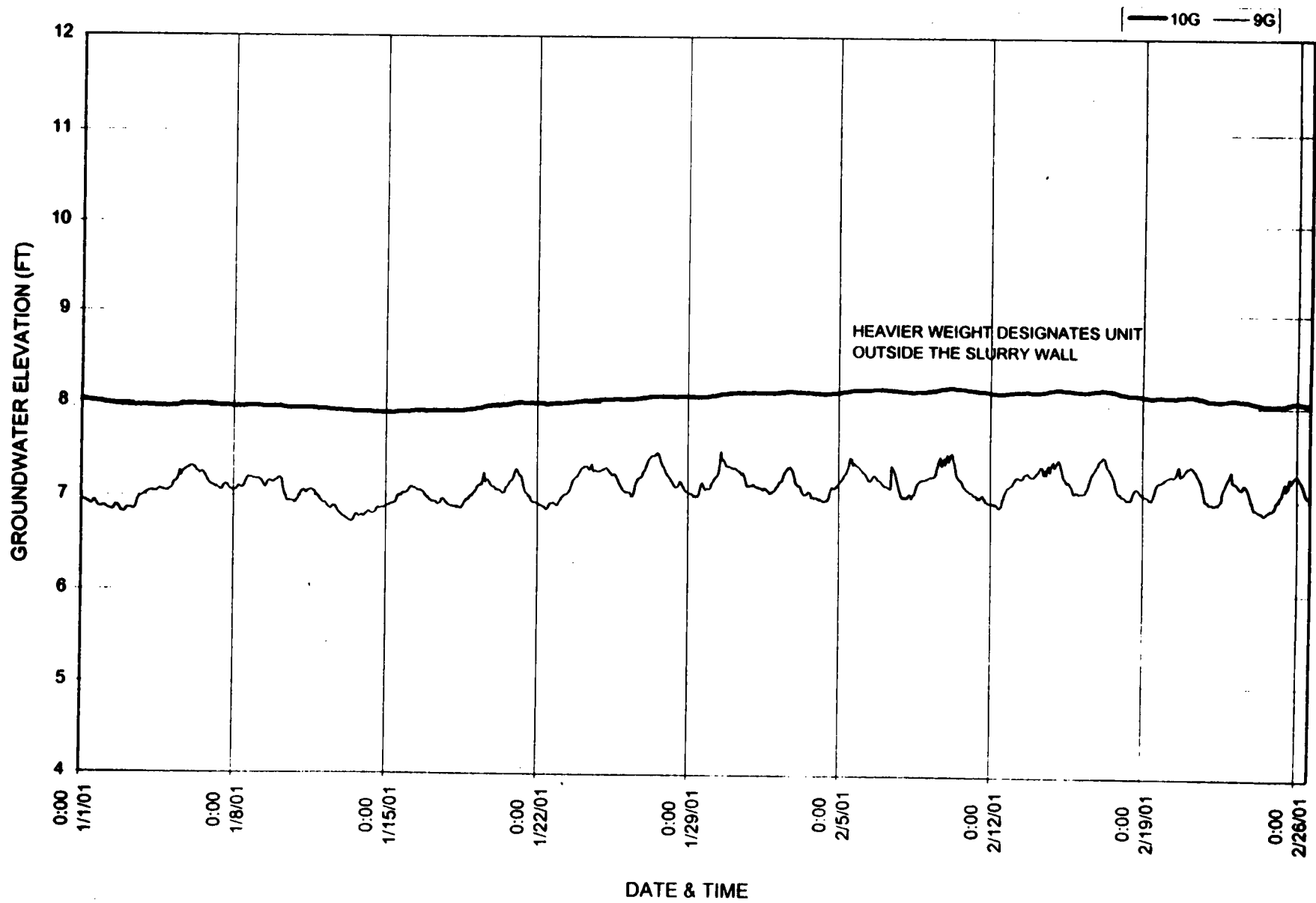


# KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 SAND & GRAVEL UNITS

— 8S — 7S



# KIN-BUC LANDFILL GROUNDWATER ELEVATION AT TRANSECT No.5 REFUSE UNITS





**IT Corporation**  
Crossroads Corporate Center  
One International Boulevard, Suite 700  
Mahwah, NJ 07495-0086  
Tel. 201.512.5700  
Fax. 201.512.5786  
A Member of The IT Group

April 12, 2001  
Project 796201

Carl Januszkiewicz  
Waste Management, Inc.  
Kin-Buc Landfill Treatment Plant  
383 Meadow Road  
Edison, NJ 08817

Re: Hydraulic Monitoring for March 2001

Dear Mr. Januszkiewicz:

A site visit was completed on March 21, 2001 to download water level recorder data and obtain manual water level measurements. The following is an update of the hydraulic monitoring for the month of March 2001 at the Kin-Buc Landfill. This information is to be included in the quarterly report, which is to be submitted to the EPA in mid-May. As agreed with WMI, we will download and review the hydraulic monitoring data for the Kin-Buc site on a monthly basis.

Attachment 1 shows the hydrographs for each of the transect locations.

#### **Transect 1**

**Refuse (1G/2G)** - These monitoring wells indicate that intragradient conditions are being maintained at this location.

#### **Transect 2**

**Refuse (3G/4G)** - Intragradient conditions were maintained throughout the month.

**Sand and Gravel (3S/4S)** - Intragradient conditions were generally observed during the month.

#### **Transect 3**

**Refuse (5G/6G)** - Intragradient conditions were maintained throughout the month.

**Sand and Gravel (5S/6S)** - Intragradient conditions were maintained throughout the month.

#### **Transect 4**

**Refuse Oil Seeps Area (13G/15G)** - These monitoring wells indicate that intragradient conditions are being maintained at this location.

**Sand and Gravel Oil Seeps Area (13S/15S)** - Intragradient conditions were observed during the month. In many instances, head differences between W-13S and W-15S were very minor (less than a tenth of a foot) and may not be significant in any event.

Carl Januszkiewicz  
April 12, 2001  
Page 2

Project 796201

**Sand and Gravel (7S/8S) - Intragradient conditions were observed during the month.**

**Transect 5**

**Refuse (9G/10G) -** These monitoring wells indicate that intragradient conditions are being maintained at this location.

**Groundwater and Leachate Collection**

Based on data provided by U.S. Filter, the following volumes of groundwater and leachate were extracted from the sand and gravel wells and leachate collection system:

S&G #1	S&G #2	S&G #3	S&G #4	Leachate
0 gal.	250,500 gal.	65,054 gal.	0 gal.	44,866 gal.
0 gpd	8,083 gpd	2,099 gpd	0 gpd	1,447 gpd

The average groundwater extraction rate of 10,182 gpd is below the recommended extraction rate of 15,000 gpd. The leachate extraction rate of 1,447 gpd is consistent with the recommended rate of 1,500 gpd.

**CONCLUSIONS/RECOMMENDATIONS**

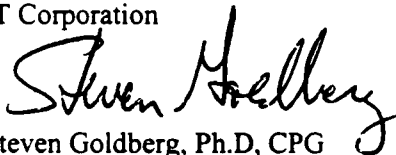
Intragradient conditions are generally being maintained at the transect locations.


Groundwater extraction rates should be adjusted to meet the recommended rates of 10,000 gpd and 5,000 gpd from S&G Wells 2 and 3, respectively. Leachate collection rates should be maintained at 1,500 gpd.

We trust you find this information useful. If you have any questions, please do not hesitate to contact us.

Sincerely,

IT Corporation

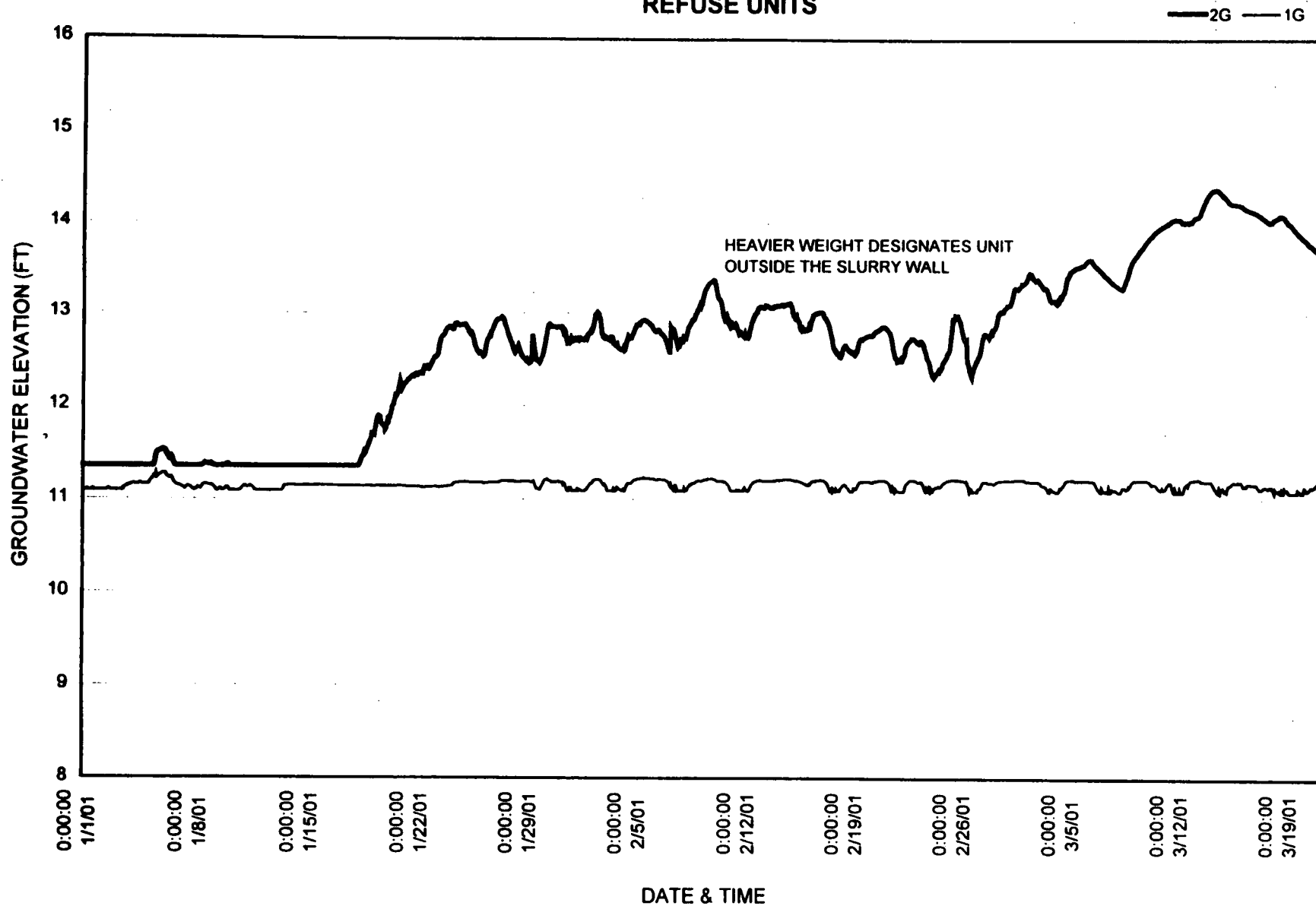
  
Steven Goldberg, Ph.D, CPG  
Senior Hydrogeologist

  
Thomas Connors, P.E.  
Project Manager

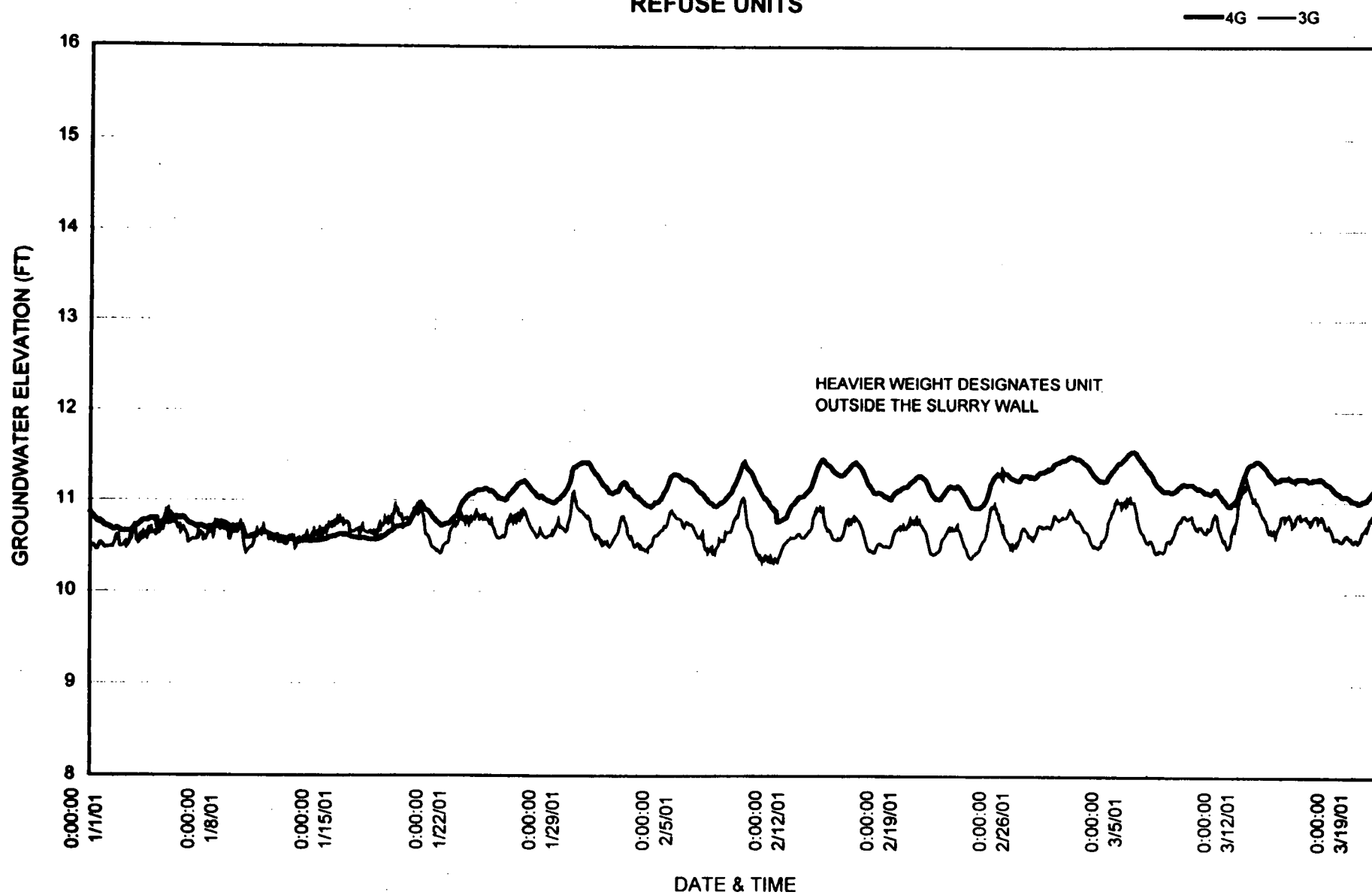
Attachments

cc: Glenn Grieb, US Filter

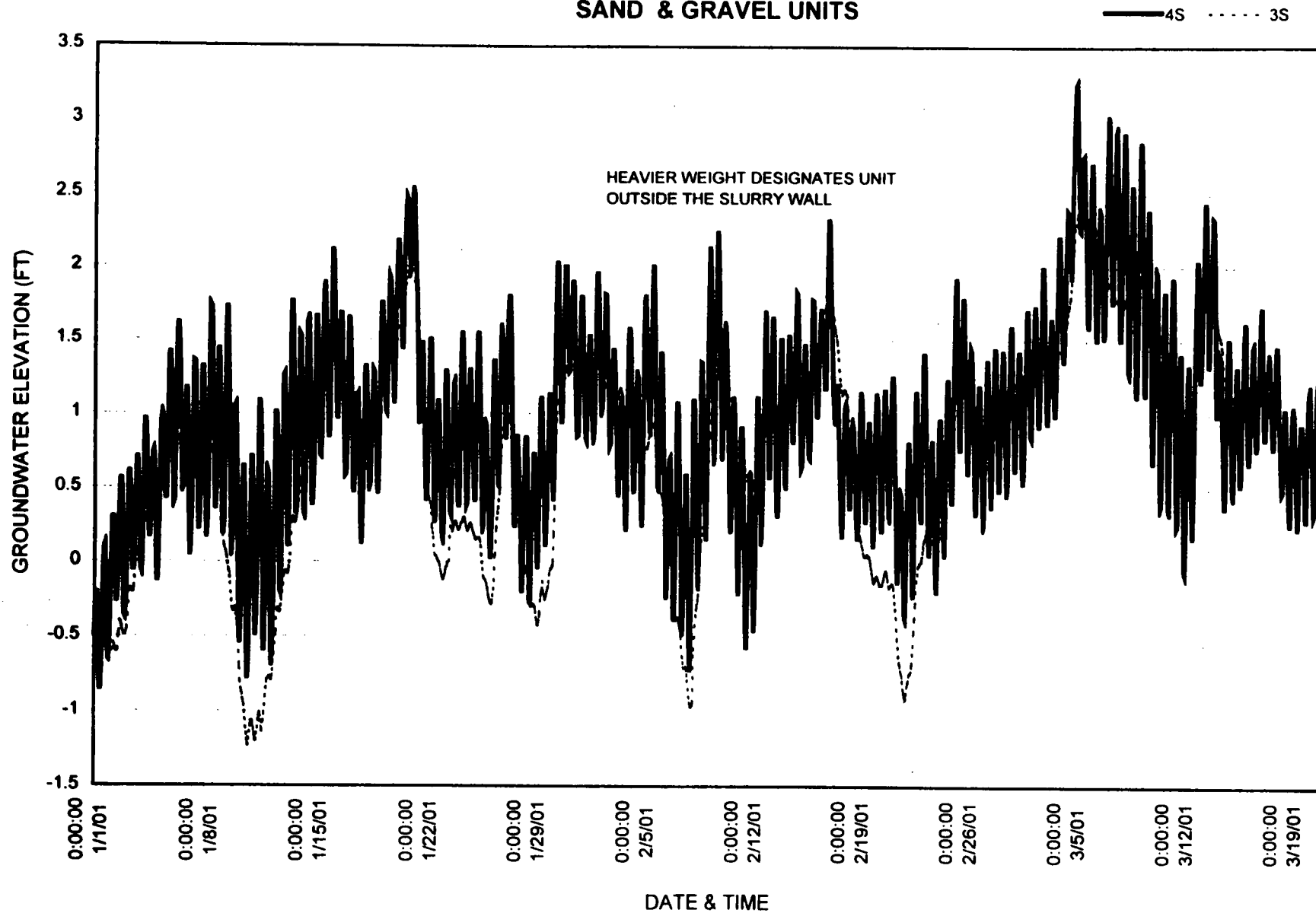
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No. 1  
REFUSE UNITS



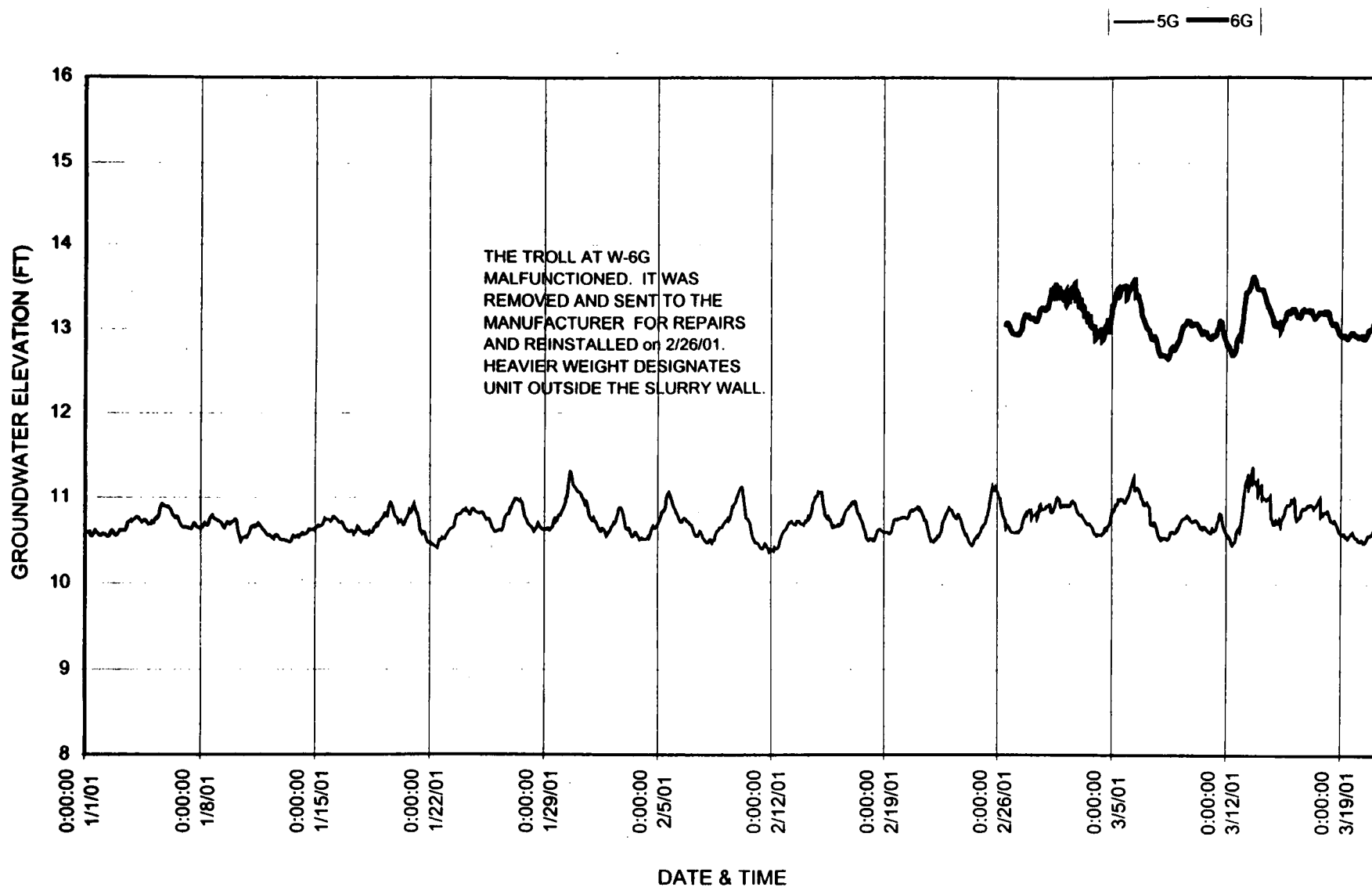
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.2  
REFUSE UNITS



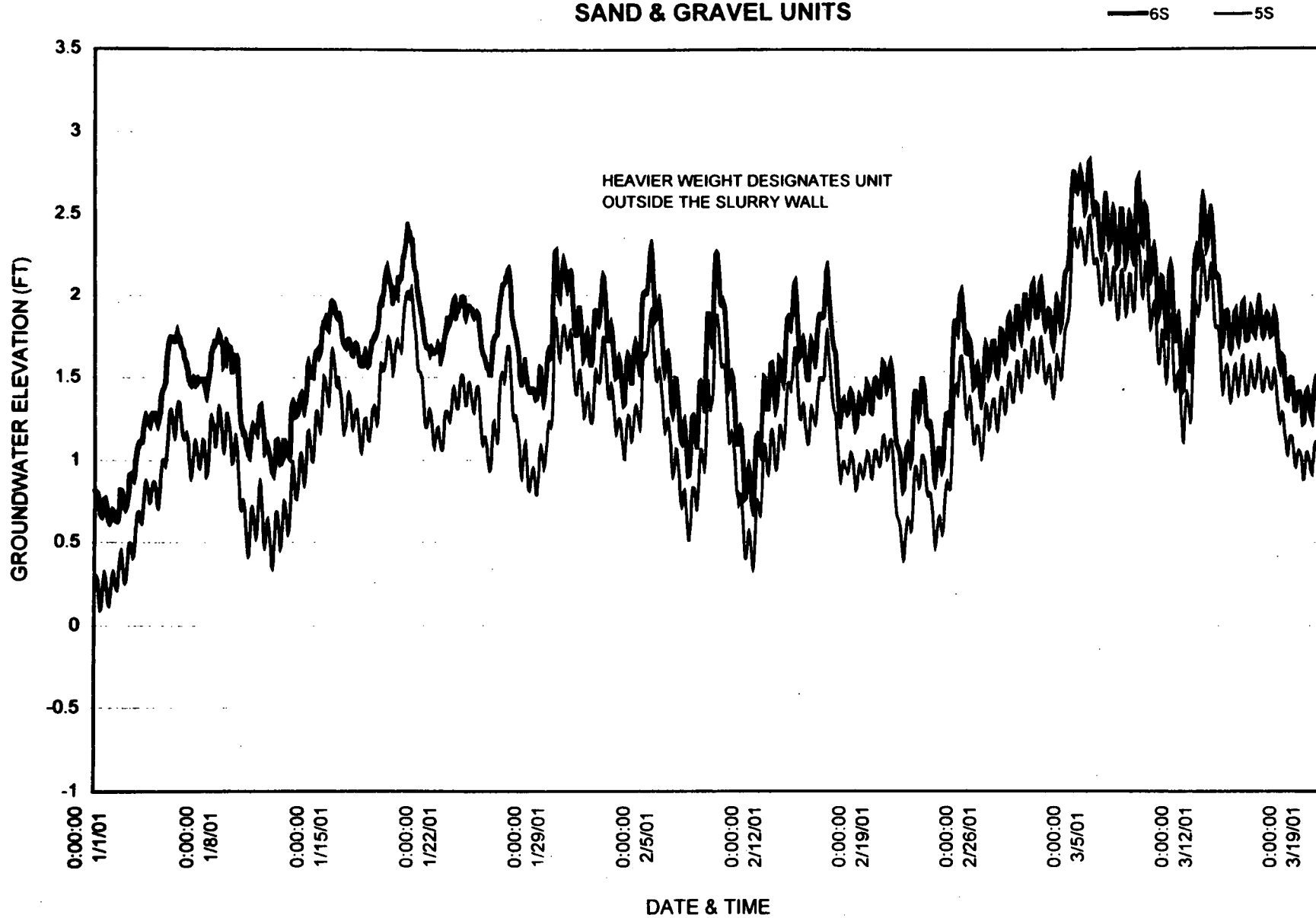
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.2  
SAND & GRAVEL UNITS



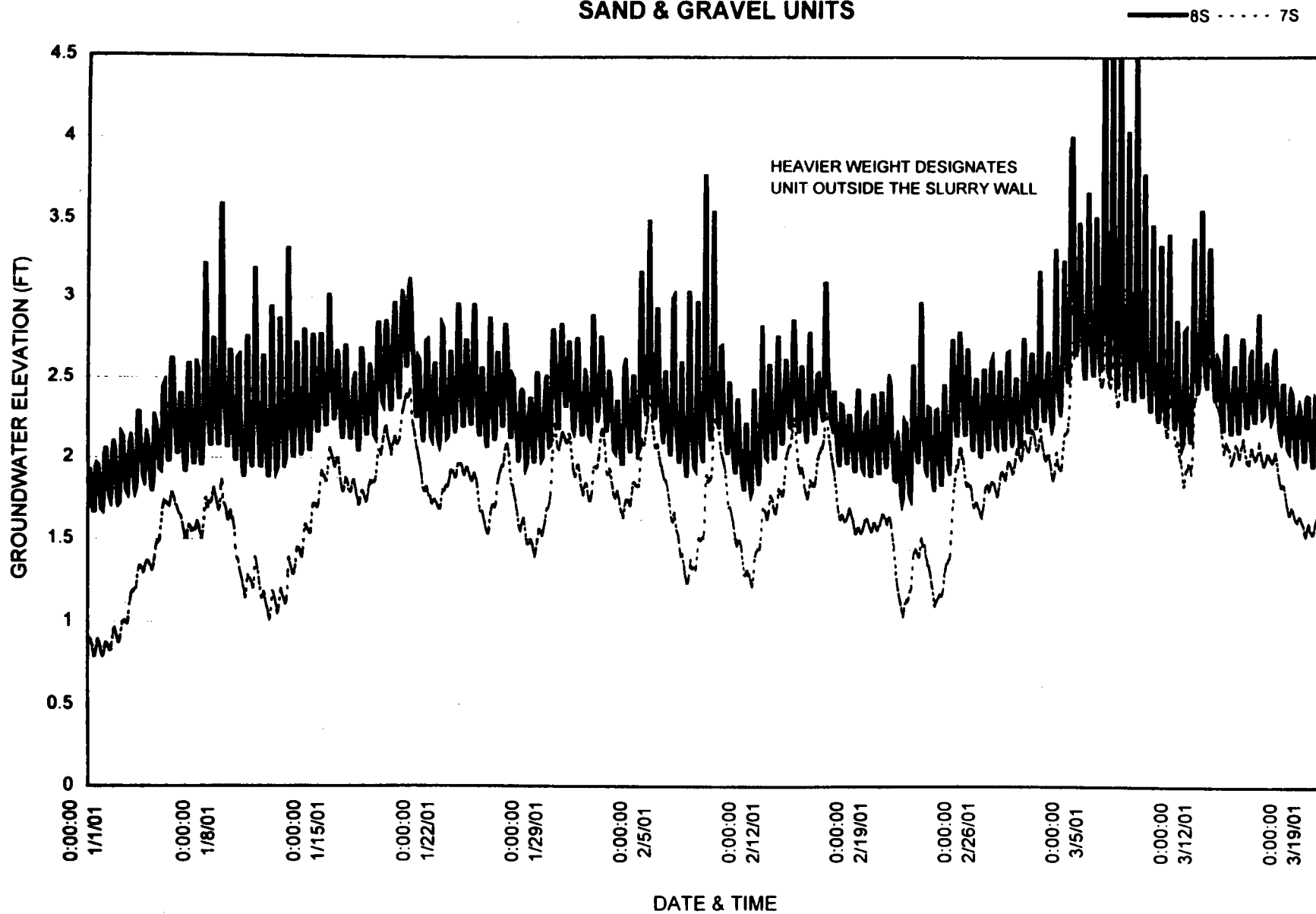
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.3  
REFUSE UNITS



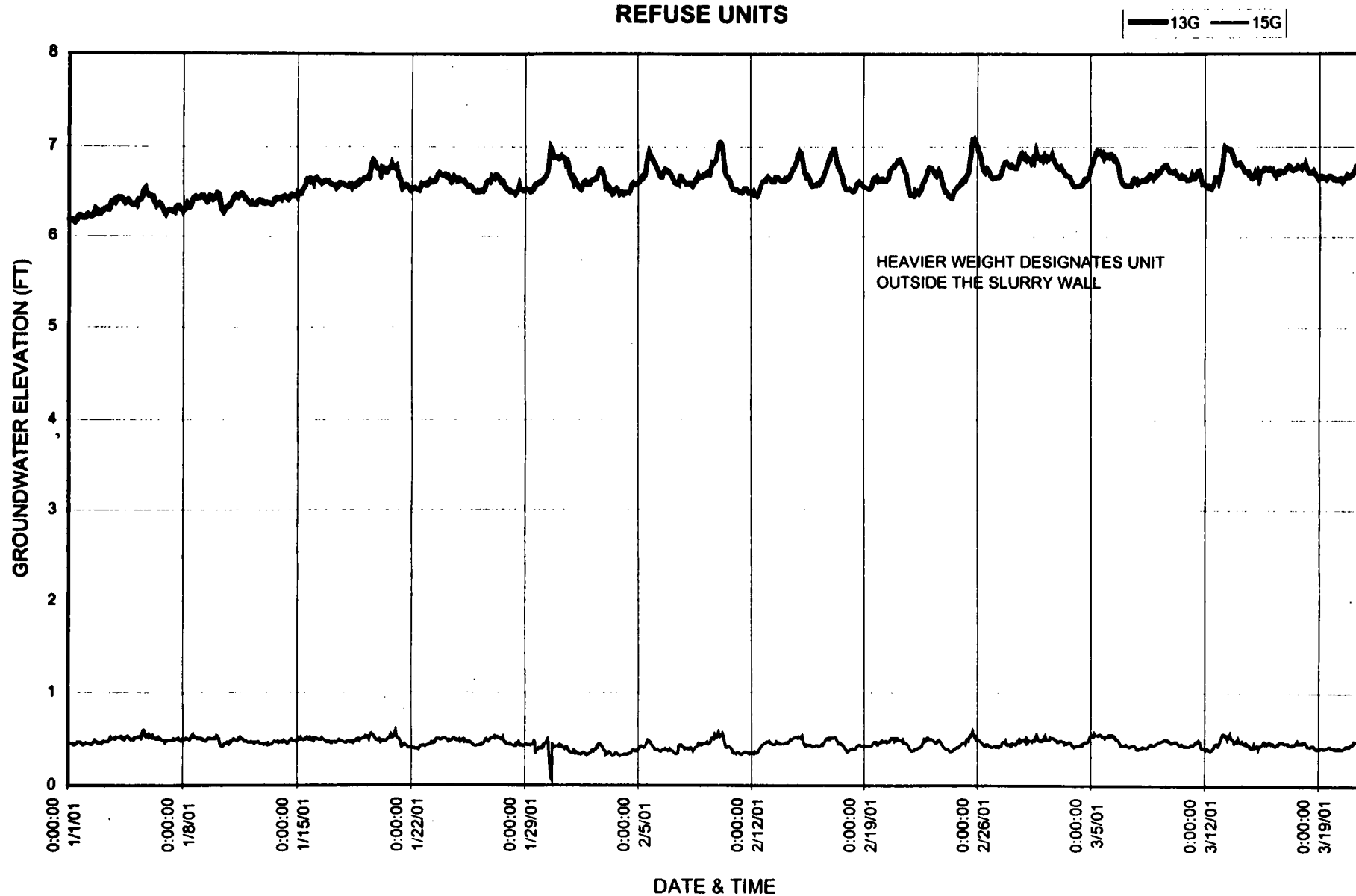
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.3  
SAND & GRAVEL UNITS



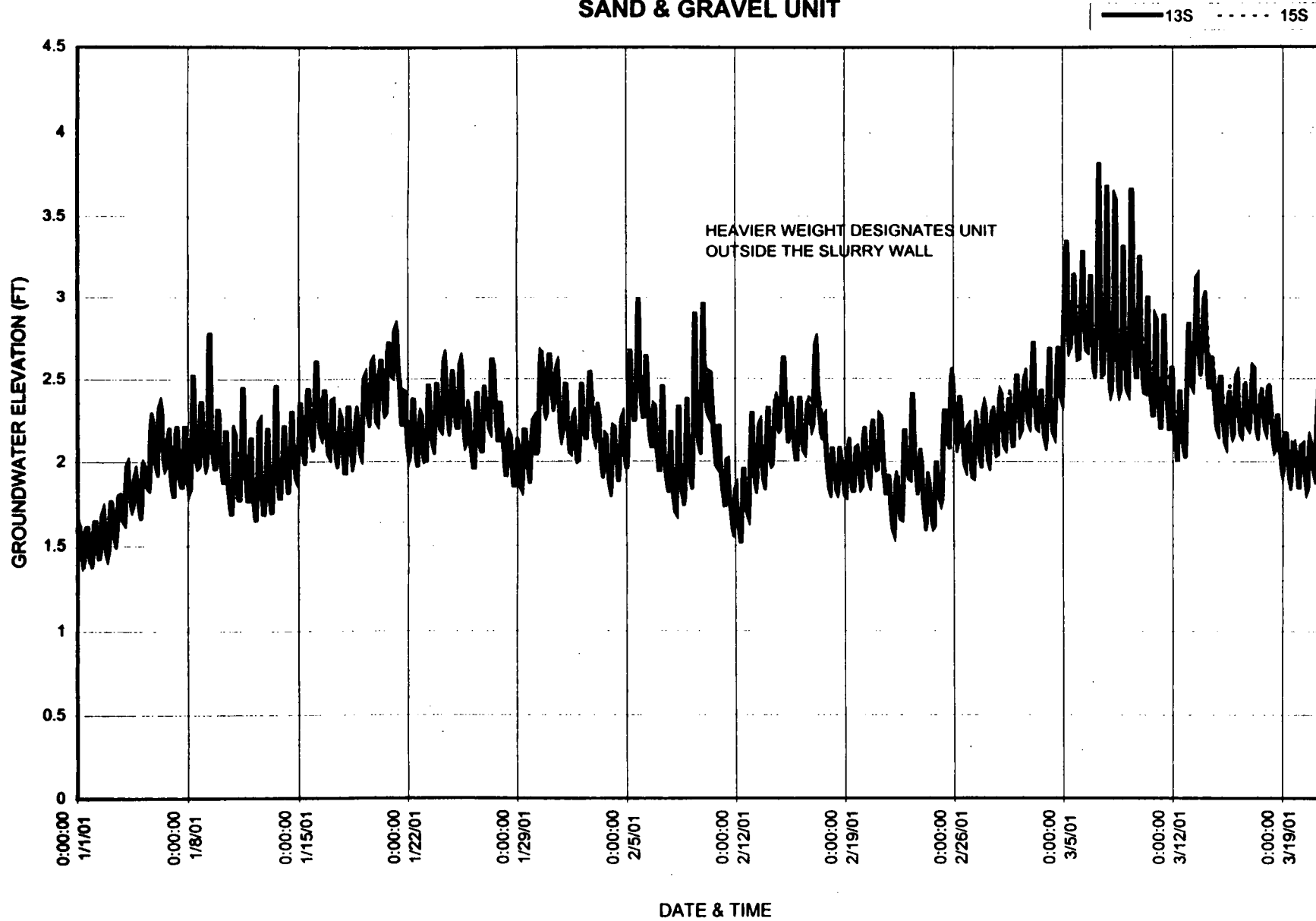
KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4  
SAND & GRAVEL UNITS



**KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 (OSA)**  
**REFUSE UNITS**



**KIN-BUC LANDFILL GROUNDWATER ELEVATION HYDROGRAPH AT TRANSECT No.4 (OSA)**  
**SAND & GRAVEL UNIT**



# KIN-BUC LANDFILL GROUNDWATER ELEVATION AT TRANSECT No.5 REFUSE UNITS

